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OKEHAMPTON EXPERIENCES, 1894.

BY

MAJOR A. J. HUGHES, R.A.

(A Lecture delivered at the Royal Artillery Institution, 11th October, 1894).

COLONEL R. D. E. LOCKHART, R.A., IN THE CHAIR.

THE CHAIRMAN—Gentlemen, the subject to night and the lecturer are both well known to you. I only ask you to take note of anything that occurs to you in the lecture that you may disagree with, or which you may think specially worthy of notice, or which you do not quite understand.

GENTLEMEN—It was with great diffidence that I accepted the kind invitation to deliver a lecture on this year's Okehampton Experiences, for now that the system of practice is so well-defined and known, the changes from year to year are very small and, consequently, I am afraid you will find the lecture in a great measure a repetition of those of former years.

The system of issuing schemes, giving orders, &c., was very similar to that of the two previous years.

The chief alterations in the practice were—

First, there were more changes of fire when in action and, therefore, fewer changes of position.

Secondly, the targets were more diverse.

BRIGADE PRACTICE.

The interest in the Brigade practice centred rather in the fire tactics, transmission of orders, &c., than in the actual shooting, for owing to the necessity of using up the common, nothing else was employed. No results were therefore taken, and when the effect is certain to be unknown, not much interest can be shown in the actual shooting.

Orders were generally written and sent by dismounted orderlies. One Brigade-division had a system of mounted orderlies, which appeared to work well. When in action the orderlies of the Officer Commanding the Brigade-division remained mounted, some little distance in rear of, but within sight of, the Officer Commanding; one of them always keeping a watch on the Adjutant. When an order had to be sent, the Adjutant having written it, started off with it towards the orderlies, seeing him coming, one of them at once galloped up, took the order, and returned to await his turn again.

Owing to the varieties of carriages, sights and clamps now in use, great care has to be taken in sending orders for range and fuze from one battery to another, and mistakes arose on several occasions; in

fact, with batteries coming from different stations, it is very hard to avoid them.

Take the following case of three batteries, A., B., C., equipped as follows :—

A.	having	Mark II.	carriage	and	Mark I.	sight.	
B.	"	"	"	"	"	"	with altered clamp.
C.	"	"	I.	"	"	"	

Say the range is 2100 yards.

If using **T** scale and yards, B. and C. would have the same elevation, *i.e.*, 2100 yards, and A. a greater one (2200); whilst, if using Scott's sights and degrees, A. and B. would have the same elevation ($3^{\circ} 3'$), and C. the lesser one ($2^{\circ} 48'$). Thus, not only has the Adjutant to know what carriages and sights the batteries have, but even their clamps.

The question, raised at this lecture two years ago by Col. Ollivant, as to whether it is necessary for a Battery Commander to verify, before adopting a range and fuze passed to him, still appears unsettled. The balance of opinion certainly is in favour of acceptance at once, because :

First, verification is generally impossible, on account of the number of shells falling on the target.

Second, concentration should be sudden, and if each battery has to verify, it cannot be so.

It is, however, difficult to tell whether such a fire would be effective. I think it should, for there is rarely more than 50 yards between the elevations fired at by batteries when practising on the same day over the same ground : unless, of course, through bad observation any battery has not found the range. It would, I think, be interesting to arrange a Brigade-day, so as to have range reports and test the question thoroughly. Targets to be placed so that each battery had a separate one to start with, and as soon as each had reported range and fuze, the Officer Commanding could (in place of concentrating) change the targets amongst the batteries, who should open at once with the given range and fuze.

OCCUPATION OF POSITIONS.

The two methods, as usual, gave rise to a good deal of talk.

With regard to the deliberate, it struck one that it was a mistake for the Section Commander and gun-layers to make a race of it when doubling out to the Battery Commander. The latter could not start his instructions till all had arrived; further, the rush looks bad, and has the disadvantage that the layers arrive breathless, and shaking so much, that many are quite unable to set their sights. A slow, steady double appears quite sufficient.

The chief cause of failure of the deliberate was, that the gun-layers did not pay sufficient attention to choosing positions for their guns from which the target could be seen over the sights; consequently, after the guns were in action they often had to be shifted. In order to avoid this, in some batteries the Section Commanders, before returning to the battery, placed their layers, and gave them orders not to move. This generally worked well, and is quite worth the extra time it takes.

Section Commanders before leaving the layers should look to the dressing, and if one section cannot see the target without advancing far to the front, it appears desirable that the Section Commander should report it. This seems trivial, but neglect in reporting it often had bad results, as the following case, which occurred more than once, shows. The layers of a battery coming into action by the deliberate method, having had the target pointed out to them, extended from the right and took up positions for their guns; now, in consequence of the ground, the layers of the left section, in order to see the target, had to advance further to the front than those of the centre and right, this generally ended in one of two ways, both rather disastrous; either—as the battery was coming up the left section layers, getting nervous about their dressing and seeing the Commanding Officer on their right, dressed back in line with the remainder, and, consequently, the guns could not see the target; or else, if they stood fast, the guns when in action were so far in advance that it was dangerous for the others to fire.

When, however, the Battery Commander was on the left flank, *i.e.*, the advanced one, the other layers dressed up and no evil resulted. This seems to point to the necessity for the Battery Commander, after the layers are placed, but before the battery arrives, dressing them up on to the most advanced layer, rather than to the flank on which he happens to be. Sometimes the Battery Commander, when pointing out the target, appeared to go further forward than was necessary, and it was suggested that better concealment would be obtained if he only went sufficiently forward to be able just to see the target, and that the layers, after they had extended, should advance far enough to be able to see it over the sights. A few tried showing the target to the Section Commanders first, and then they showed it to their layers.

With reference to this, one must remember that the ground at Okehampton, a bare hillside with no bushes, &c., makes it very hard to avoid exposure; further, the exposure always appears more to an onlooker with the battery than from the target. The group of layers, when seen from a flank, or from behind at a distance of a few yards, appears very different to what it does from the front at 3000 yards.

On several occasions, together with officers of the courses, I stood looking out from a bomb-proof close to the target. Although the range was only 2000 yards, very little could be seen, and had we not known exactly where to look for the battery, it could easily have escaped notice until the first gun.

I think more criticism from the target end of the range, especially during Brigade practice, would be valuable; but, of course, it must be from a bomb-proof close to the target, and not from the usual position of the range-party on a flank.

One of the causes of the direct method coming to grief was that of not advancing sufficiently to the front for all the layers to see the target over the sights; although done in the hope of not exposing the battery, it appears a fatal error, for on all occasions, and most certainly when the direct method is employed (*i.e.*, range short and great rapidity desirable), the first desideratum is to be able to see the target over the sights without any running up.

With both methods it sometimes happened that a flank section, even if run up to the safe limit, was still unable to see the target. When this is the case, and there is room on the other flank, the easiest way out of the difficulty appeared to be for the section to be limbered up and moved round, fire in the meantime being continued with the other guns. Should this be impossible, clinometer elevation must be given to the section, the angle of sight being obtained from one of the guns that can see the target. This method with our present clinometer is very complicated, as it entails two different elevations in the battery, and under such conditions it is very easy for the Battery Commander to make a slip. With a clinometer having an adjustable zero, such as the German or Scott's sight, fitted as recommended last year, it is comparatively simple. All the Section Commander would have to do would be to set it at the **T** elevation, place it on one of the guns that could see the target after it was laid, and automatically register the angle of sight by working the small screw until the bubble is in the centre of its run. The Battery Commander, thus relieved of all trouble, could begin with four guns, and the other two would be ready to open fire by the time he had ranged.

Failing such a clinometer, the best way appears to be to ignore the angle of sight and use clinometer elevation for all the guns, only planting pickets for those that cannot see the target, the remainder laying for direction over the vent and muzzle.

The method of one section using quadrant and the remainder **T** elevation was successfully employed by one Battery Commander; on all the other occasions, as far as I know, the guns simply remained out of action. Seeing this happen with a single Brigade-division on positions so well known, it seems probable that with a long line, sections or even, perhaps, batteries could easily find themselves so situated that they must either have recourse to pickets or remain silent.

At Brigade practice, when employing the direct method, the intervals between batteries sometimes suffered, and appeared to be best kept when the final advance was done in short echelon; this was especially noticeable in those cases in which, owing to the lie of the ground, the line of advance was not quite at right-angles to the position to be occupied.

The system, mentioned last year, of the Battery Commander pointing out the target to the nearest Section Commander, and leaving the others to pick it up from him, again answered well. In pointing it out to the nearest Section Commander, the best and quickest was generally for the Battery Commander to lay the first gun.

Misunderstandings of right and left were very rare; in fact, I only heard of one, due, I believe, to the words "enemy's left" being mistaken. There was more doubt when numbers were employed, and one heard such questions as, "His own number two, or do you mean number two from the right?" It would tend to obviate these if all numbers were to be as read, *i.e.*, left to right, or else that the numbers were always to begin from the firer's right.

SIGNALS AND ORDERS.

A few batteries used a number of extra signals. It appeared, however,

that those at present in use are quite sufficient, and that more are only confusing. Repetition of, and extra orders, were still sometimes heard. A repetition considered necessary by some Battery Commanders was that of repeating the range after a doubtful observation. This seems unnecessary, because, having been given once, the guns are ready laid; further, it causes delay, because of the many repetitions which it necessitates (four for each doubtful round), and also because the layer, hearing an elevation given, forgets that his gun is already laid, and is apt to put his sight in the gun and start re-laying. During slow fire, time was sometimes lost by the Battery Commander, intent on the target, not noticing when a gun was ready. To obviate this some Commanding Officers allowed their Section Commanders to draw their attention verbally; others trained their recorders to always look in the battery, and then when the Section Commander signalled, to say "Gun ready, sir."

APPEARING TARGETS.

Petards were always fired at any new target, both as it appeared and also a few seconds after. The moving targets, both cavalry and infantry, also fired them just previous to, and when they began to move; and orders were issued that, whenever any petards were noticed, fire was to be at once turned on to that target. The system worked well, and even when the petards had to be supplemented by orders, they were of great use in enabling the Battery Commander to quickly find the new target.

In one series a target of kneeling dummies appeared on the left flank as the battery was on the move. When it appeared, some batteries were in column of sections, most of them wheeled towards the target and came into action front, others wheeled away and came into action rear. This latter was generally considered best; it was quicker, and had the further advantage that, should any of the horses be struck, the limbers would not prevent fire being opened; to do it, however, requires practice, because, undoubtedly, one's natural inclination is to wheel up.

A few batteries even preferred coming into action rear on ordinary occasions. This preference is partly due, I think, to the time limit. For with action rear the first gun is, as a rule, got off slightly quicker, because Nos. 1, 2 and 3 can go on with the laying while 4 and 5 are struggling with the magazines; but with action front they can do little until 4 and 5, having got rid of the magazines, have come to the wheels.

On the other hand, the great essentials of dressing and intervals, with action rear, are rarely so good, and this difficulty, in the judgment of most, more than over-balanced the slight advantage of a quicker first gun.

ECHELON AND MOVING TARGETS.

An echelon series, very similar to the trial two fired last year, formed part of the battery service. The target consisted of three sets of 15 standing dummies (each in line), and three sets of 15 kneeling dummies. They were supposed to represent advancing infantry, and were placed in echelon at different intervals, the farthest at about 2200, and the

nearest 700 yards. The battery fired for four minutes at the furthest, and three minutes at each of the others.

The average results in the 19 minutes were:—Rounds fired, 60·2 ; hits, 81 ; dummies disabled, 32·3 ; but the chief interest lies in the various methods adopted for attacking such a target. Although, perhaps, hardly a service target, it was generally considered a good one, since it required quickness, and shewed if a battery could adapt itself to novel conditions.

The following three methods were employed:—

1. Telling off a ranging section and keeping the other four guns for time shrapnel, in a very similar manner to that laid down for an advancing target.
2. Ranging on the farthest, in the usual manner, and then keeping up ordinary fire, and when the change of target was ordered, simply giving "Change target. Range —, fuze —," and if these were not correct, changing either without interrupting "ordinary fire."
3. Very similar to the second, but using "rapid fire, by sections," in place of ordinary fire.

The first system appeared to answer well provided there was no hitch, but if anything went wrong, such as a ranging gun being out of action for a short time, the whole battery was liable to be upset.

The second method was, by almost universal opinion, considered the best. It seemed to run smoothest, and casualties hardly affected it; as many rounds were fired as with the others, and better results were obtained.

The third system resulted in uncontrolled and, consequently, unaimed fire, and great waste of ammunition.

A slow-moving target, advancing from about 2000 to 1000 yards, was tried for the first time at Okehampton. Although the ground had previously been considered too rough, it worked well, and only two runs were spoilt by the rope being cut. Next year there will be a better target, running on rails down hill. The series was to range on a column, distant about 2100 yards, and then, as soon as ordinary fire was reached, the moving target, placed about 50 yards to the flank of the column, started off, firing petards as it began to move, in order to draw attention to it. It advanced at a walk for about 900 yards, the average time it was moving being about 10 minutes. The number of rounds fired at it in the time varied from six to 41, the average being 23.

Some Battery Commanders adopted the system of a ranging section, whilst others tried ordinary fire round the battery, dropping range and fuze as the target advanced.

Failure in the ranging section system was generally due to the delays caused by:—

1. Not giving the order for the time sections soon enough.
2. Changing the fuzes of the second and third rounds after they were already set.
3. Not setting the second and third fuzes at the limber.
4. Ranging section not giving sufficient deflection to ensure the rounds being to windward.

The result of the first was that the order for "rapid fire" came before the sections were ready, consequently, after the order had been given, there was a long pause before a gun fired. This pause led to the second error, for the Battery Commander, seeing the target advancing all this time, and thinking it was getting ahead of the battery, would alter the range and fuze for the second and third rounds, and the re-setting of the fuzes caused a yet greater delay.

The necessity, when firing at a moving target, of not giving orders too quickly one after the other, or altering those once given, was very evident. Perhaps an actual example will explain better. Say the ranging section is at 1800 yards, giving a minus, and the remainder loaded and laid at 1750 yards, fuze 8, and two shell ready at fuze $7\frac{3}{4}$, $7\frac{1}{2}$: the Battery Commander fires another round and obtains a plus, and at once orders "Three rounds, rapid fire." The first four rounds all burst on graze, shewing fuze 8 to be too long. One's inclination is to order the other fuzes to be shortened, and should one do so the delay caused by altering them will probably allow the target to get inside the range; further, the torrent of new orders upsets the battery. In such a case it appears better not to attempt to alter the fuzes, but let them be fired, they will act on graze and do some damage, and the next batch can be ordered shorter.

The third reason, *i.e.*, limber numbers not setting fuzes, was perhaps the most frequent. When fuzes were set at the limber the system worked well; thus, one battery took only 50 seconds to fire its first set of rapid fire (two rounds a gun), and 1 minute 30 seconds for the next (this time three rounds a gun).

The fourth cause led to many ranging rounds being lost, and was liable to throw out the Battery Commander.

The other system, a kind of ordinary fire through the battery, was very similar to that described for the echelon target. The following modification appeared to give the best results: On the change to moving target being ordered, the Battery Commander gave "Range — slow fire," and fired until he had roughly fixed its position, and then started ordinary fire. The fire was from the right. After No. 4 had fired, the Commanding Officer gave new length of fuze to right section, and after No. 6 had fired, gave final elevation. You will see that it is not exactly ordinary fire, for the right section waited to load until they received a new fuze. Also, the centre and left Section Commanders made a drop in range and fuze, on their own account, from that ordered for the right section. The centre giving 25 yards less elevation and $\frac{1}{4}$ fuze; the left 50 yards and $\frac{1}{2}$ fuze. It is considerably simpler than it appears from the explanation, and it certainly worked well, and at ranges when observation is easy, say under 1800 yards, would probably give a more effective fire than with a ranging section. At longer ranges the latter is probably better, as it fixes the position of the target with greater accuracy.

A great deal of time was often taken up changing from the standing to the moving target. The latter, although it fired petards both before and after starting, was certainly hard to see; but even after the layers had made it out, there was often a further delay, generally caused by in-

decision as to what was to be done with shell in the guns at the time the change was made, and many batteries did not get fairly started at the target until it had completed almost half its run. The quickest change was made in 30 seconds, and was by a battery employing the ordinary fire method, and it certainly is one of the advantages of that method, that the change is easier and quicker.

RANGING.

The system of ranging by echelon, or ladder of distances, again cropped up and was tried on several occasions, with almost invariably bad results. Thus, on one occasion the Commanding Officer misjudged the range, about 2100 yards, by over 400 yards, and used eight ranging rounds before obtaining a plus, whereas with the ordinary method he would probably only have needed half as many. It appears to me that quickness in ranging for elevation at short ranges should be gained more by quickness on the part of the Battery Commander in making up his mind and giving orders for the next round at once, than by an elaborate special system that is liable to collapse should anything unforeseen occur. Almost always, at short ranges, glasses can be dispensed with, this alone will save 10 or 20 seconds a round. Again, ranging to 25 yards is not required before going to fuze, at so short a range there is little difficulty in working both together. Some Battery Commanders gave three lengths of fuze as suggested last year, and it again appeared to work well; some even attempted it at long ranges, but at these I hardly think it succeeded.

The judgment of distances was often at fault, and how difficult it is to estimate even a short range, 700 to 1200 yards, was conclusively shewn by the three series fired at those ranges. It was rarely that the first elevation was within 300 yards, on some occasions not within 700. Another thing noticed at short ranges was that the fuzes almost invariably were very short, this was especially the case when firing down hill, most batteries having them from 150 to 200 yards short.

FIRE FROM UNDER COVER.

The fire from under cover was hardly so successful as that of last year. The position was certainly a more difficult one, for it required very careful reconnoitring to get the battery well covered from the enemy's view. Insufficient reconnoitring and moving the layers out too soon generally ended in extra delay; it saved time in the end to thoroughly reconnoitre the whole front to be occupied *before* calling out the layers, for when once the latter are out any change is sure to lead to confusion.

The actual time taken planting pickets varied from two to nearly 14 minutes, and was quickest in those batteries whose layers planted their pickets as at drill. The Commanding Officer pointing out the position of a front flank picket and the other layers simply extending from it. Done this way, from two to three minutes is ample time in which to plant them. It also saves time if Section Commanders remain out and superintend the planting of the pickets, only returning to the battery when the layers are in position.

Another difficulty of the position was, that the guns were often on

considerably different levels, and this not being noticed led to difficulty in ranging. Even when noticed it is hard to correct, especially with our present clinometer. The correction for each section has practically to be guessed, some idea of it may, perhaps, be ascertained from the range-finder's range in combination with the rule of one minute giving an inch in each 100 yards; or roughly, 10 minutes will give the correction for the same number of feet that there are 100 of yards in range. The difficulty, however, of remembering such rules and figures would, I think, induce one to evade rather than overcome the trouble. Thus, if the slope is from a flank, one could range with the centre section, and then on opening ordinary fire the section on one flank would shoot long and that on the other short, the mean trajectory being correct. Or again, as actually happened, a cross-fire may attain the desired object if the target is inclined to the line of fire. Another difficulty that cropped up was that of deflection. It being sometimes forgotten that after the first general deflection for wind the Battery Commander must order it for *individual* guns according to the result of their fire, since the pickets may be wrong and Section Commanders cannot see the target. He can either order the actual deflection himself, thus "No. 2 gun 10 minutes more deflection right," or else can call out "last round 20 feet to left," and leave the Section Commander to give the necessary correction.

RESULTS.

The results are arranged in as nearly as possible the same form as those of last year, but even so, afford small basis for comparison on account of the different nature and positions of the targets used.

As to the artillery target, it is the first time for some years that so short a range, 2000 yards, has been used. The results are rather disappointing, for the difference seems to have led to no increased effect. The guns were placed just short of rather a flat crest, the background was dark, and made the target difficult to see, only about three guns on one flank being at all clear. They were first placed so that the ground line of Holstock, where the batteries come into action, could just be seen, but when placed thus, it was found they could not be seen from Holstock except with glasses, and then only with difficulty, they were therefore run forward until about the upper half could be seen. It would be rather interesting to let them fire petards every 30 seconds and try a series at them as at first placed.

Two series were fired under conditions suggested by officers of the other arms. Both were arranged with a view to seeing the depth covered by shrapnel bullets.

In the first series the targets consisted of four lines covering one another at 300 yards distance. The first line contained 50 kneeling dummies, the second and third 50 standing, and the fourth 20 Hessians. The battery began on the third, then changed to the second and then the front, firing for five minutes at each. The average effect of two batteries was fourth line, 40.5 hits on 19 Hessians; third line, 157 hits on 36.5 dummies; second line, 107 hits on 37 dummies; first line, 38.5 hits on 19.5 dummies. In this series the effect due to the depth is

only shewn by the results being greater than the average results at single targets. The other series shewed them better, for the battery only fired at the front line. The target consisted of three lines, first, 90 kneeling dummies; second, 70 standing dummies; third, 24 Hessians. The distance between the first and second was 200, and between the second and third nearly 300 yards. The time taken was nine minutes 40 seconds, during which 56 rounds were fired.

The effects, first line, 327 on 84; second line, 82 on 44; 3rd line, 22 on 13, were good, and the results on the second and third lines are all fairly due to the depth of the shrapnel and not to exceptional rounds, because in the whole series no time shell and only two percussion burst beyond the front line.

COMPETITIVE.

The change from the column to a 4-gun battery for the first series seemed popular. From the results it appears as though four marks per dummy was hardly sufficient to put the series as regards marks on an equality with the second and third. Taking Okehampton, Glenbeigh and Shoebury (37 batteries), the average marks obtained were in the first series 38.6; in the second, 63.1; and in the third, 60; from which it seems as though six for each dummy disabled in the first series would be a better proportion.

Only 12 batteries out of 45 fired the whole of the rounds, so that the time seems about correct. Perhaps a better distribution would be to give eight minutes for the first, seven for the second, and six for the third, so as to lay more stress on accuracy at the long range, and rapidity at the short. Almost everyone was unanimous in wanting the fire discipline marks kept up. If anyone still had any doubt on this point, the result of dropping them in India should convince him.

For instance, Colonel Ward in his report states that he found batteries "holding up the trails and lowering them together;" similarly, Colonel Tyler after giving examples, states: "No check is placed on plans and devices which may be introduced at the will of the Commander. Opinions were much more divided as to the necessity of keeping up the qualifying marks for firing, and it certainly seems hard that batteries at Okehampton and Lydd should have to obtain the same number as those at Glenbeigh, Shoebury and Morecambe, which are admittedly easier ranges for effect. It appears as though each station should have its qualifying minimum, or else it might be done away with and batteries take places 1, 2, 3, &c., at each camp.

There seemed also a desire to have the Competitive extend over the whole Service practice. It would of course tend to eliminate the luck, still I think one would have too much Competitive. Perhaps the most feasible suggestion in this direction was, to have the Competitive, much as it is at present, and to add the effects only, of one or two days' Service practice, settled on by each Camp Commandant. Its chief objection is that, when there is only a time limit and no fire discipline marks as a check, hurried fire and great waste of ammunition often spring up, the fire being conducted on the principle that if you only get off enough something must hit.

EQUIPMENT.

The sight graduations and clamps were as usual the cause of many errors. A sight marked in hundreds and fifties, from 1400 to 2000; and in twenty-five yards at longer ranges, was tried; the fifties being represented by a short line and the twenty-fives by a dot; although the figures are rather crowded owing to the short radius, they appeared better liked than the old one.

The greater number of errors in the laying examination were caused by the sight slipping when putting it into the gun. Perhaps a ratchet sight, somewhat similar to that on the quick-firer, might be tried; or, if this is considered too complicated, a better clamp. A plain nut that screwed up the sight in a somewhat similar manner to the nut on a hammer-vice might answer.

It also seems desirable that the sight should be strong enough to stand being left in the gun when fired; for even with the greatest care such a thing may happen, and a bent sight seems a heavy penalty.

Some batteries had the clamp altered so as to use a Mark I. sight in a Mark II. carriage. This rather complicates matters, for although it makes the sight correct for the yard scale, it throws out the degree scale and makes the tangent sight and Scott's sight disagree. Thus, a Battery Commander using the tangent scale employs a Mark I. range-table, whereas when he uses a Scott sight he must employ a Mark II. table. It would obviate all these difficulties if all sights were made like those for heavy guns, the yard scale being on a slip that can be changed should the carriage or charge be altered.

The mekometer was again liked; one Battery Commander considered it more reliable to accept the mekometer range than to determine it by T scale laying, and said he would have no hesitation in accepting its range when under 2000 yards and opening with time shrapnel at once, at longer ranges only using a very few ranging shots. Personally, I disagree with this, and think the results hardly justify it. Several series were spoilt owing to Battery Commanders distrusting their own observations and believing the range-finders. On service also the range-finders would probably be oftener wrong, even the mild excitement of the Competitive apparently upset them. In the first series there were six out of 15 cases in which the range-finder was not within 50 yards of the true gun range. In the second series eight out of 15, and in the third four out of 11: a total of 18 out of 41, equal to 43·9 per cent.; applying the same test to the elevation fired at (*i.e.* range as found by observation) the figures are first series, three; second, two; third, one; or only 13·3 per cent. These figures so astonished me that I thought they must be wrong, and I therefore went through all the Service practice 1894 and Competitive 1893, the latter gave 37·5 for range-finder and 5·7 for observation, whilst the Service practice, excluding Competitive, gave 32·7 for range-finder and 24 for observation. Although, of course, these figures are by no means conclusive, they all point the same way.

The results of observation would, I think, shew up even better if one could get over the dislike of calling rounds doubtful. In looking through almost any practice report one finds more wrong than

doubtful observations. In some ranging series I have seen four wrong out of six rounds and yet no doubtful; with such a large proportion wrong, some must have been doubtful, and it would have been better to have classed them as such and repeated. A doubtful round entails only the loss of one round, whereas a wrong observation generally leads to several being lost. This same difficulty occurs in India, thus Colonel Murdoch in his report on Muridki says: "Wrong observation was the most frequent fault; it must, at the same time, be admitted that the observation at Muridki is particularly difficult. A fault in observation that was noticed frequently was declaring a round plus or minus when it was doubtful. Of course such a round should be recorded as 'not observed' and be repeated even more than once if necessary."

EXPERIMENTS.

The Ordnance Committee have kindly allowed me to give the following notes of the experiments carried out at Okehampton this season.

The Q/2-guns and equipment were again used by "P" Battery, and were much liked by all who saw them, and it has, I believe, been definitely decided on for the Horse Artillery. The twist of rifling is to be further tested. Experiments so far appear to show that the lesser twist, 1/35, gives a closer pattern (the 1/28 covering about ten feet more at 75 yards burst), but the shell is not so well centred, and it is doubtful if the accuracy is sufficient to ensure good ranging. The tubes were of a different pattern to those tried last year, and gave no trouble.

Much interest was also taken in the trial of the 15-lb. shell carried out by the 75th Battery.

The charge was $15\frac{3}{4}$ oz. cordite, giving a muzzle velocity of 1550 f.s.

A radial vent was employed, and the tubes were almost identical to those used with the Q/2, and appeared very satisfactory.

The shell has a base burster of $1\frac{1}{2}$ oz., and contains 216 bullets.

Mark I. carriages were used, they were fitted with steel pockets, one on each side, to carry two fuze shells and two cartridges, the two weighing 1 qr. 16 lbs.

The service limbers and wagons were employed, the boxes being altered to carry fuze 15-lb. shell and cordite. The number of rounds carried being as at present. I am unable to give the exact weight behind the team, but it is approximately the same as with 12-lb. shells. The weight gained by the use of cordite being about equal to the extra weight of shell, tubes and steel pockets. Two of the guns were fitted with wheels similar to those on the Q/2 equipment, and they seemed to answer well. Should they be adopted there would be a gain of about 1 cwt.

Two experiments were carried out to test the smoke-giving properties of shrapnel and ring shell. In the first, service shrapnel, shrapnel with special fuze, and ring were tried. In the second, shrapnel and ring; these latter were 15-lb. shell, the shrapnel had a base burster of $1\frac{1}{2}$ oz., and the ring one of $4\frac{1}{2}$ oz. compressed powder down the centre.

In both experiments the shrapnel came out best. It is hard to say why $1\frac{1}{2}$ oz. gave more smoke than $4\frac{1}{2}$ oz., but it certainly was so, and I can only imagine that the latter was not thoroughly consumed.

Camp.	Year.	No. of Series.	Average time in action.	Range.	No. of Rounds.	Effect.		Hits per Shell.	Men hit per Shell.	Percentage of targets destroyed per minute in action.	Target.	Remarks.	
						Hits.	Men.						
ARTILLERY IN THE OPEN.													
Okehampton	...	1893	12	11 18	2845	24	19.8	9	.825	.373	2	6 guns, 3 wagons, and 40 standing dummies. { On Bluff. " Yes Tor.	
"	...	"	12	10 30	3285	24	21.6	10.16	.9	.423	2.41		
"	...	{ Average of 1892 and 1893 }	52	11 49.5	2845 to 3320	24.5	22.9	9	.93	.37	2	6 guns, 6 limbers, and 42 dummies. " Blackdown Neck. " East Mill Tor.	
"	...	1894	14	11 21	2085	24	17.6	8.3	.73	.35	1.74		
"	...	"	12	12 35	2870	24	10	6.4	.41	.27	1.21		
"	...	"	15	7 40	2680	20.4	17.3	6.6	.84	.32	3.37	Competitive. 4 gun detachments. 26 dummies.	
KNEELING DUMMIES IN LINE.													
"	...	1892	39	6 42	1300	20.7	53.5	28.9	2.58	1.39	3.32	15 standing. 15 standing.	{ In one series in 1893 the supports were kneeling.
"	...	1893	36	7 10	700	21	108.3	41.58	5.16	1.98	4.46	100 kneeling.	
"	...	1894	28	6 11	1075	17.8	53.2	29.3	3	1.64	5.87	81 kneeling dummies in line at 1 pace interval.	
STANDING DUMMIES IN LINE.													
"	...	1892	15	8 20	2000	24.75	100.5	34	4.06	1.37	5.12	80 dummies in 4 groups, 25 yards between groups, 1 pace between dummies.	
"	...	1893	12	8 30	2000	23.7	54.1	25.6	2.28	1.08	3.76		
"	...	1894	14	7 20	1950	13.6	37.2	16.7	2.73	1.22	2.82	81 standing dummies in line, at 1 pace interval.	
AVERAGE RESULTS OF BATTERY SERVICE.													
"	...	1890	...	12 11	2325	20.91	43.7	17.7	2.08	.306	2.98	49 dummies.	{ Including Competitive. " " and under cover.
"	...	1891	...	11 57	2331	25.79	48	18	1.5	.697	3.43	43.67 "	
"	...	1892	...	8 3	2285	20.97	48.2	19	2.3	.91	3.65	61.2 "	
"	...	1893	...	7 58	1938	21.17	89.24	29.22	4.21	1.38	5.07	72.5 "	Including Competitive.
"	...	1894	...	8 43	1912	22.25	42.01	17.22	1.87	0.76	3.83	52.28 "	" "

Camp	Target.	Remarks.
Okehampton	ms, 3 wagons, and 40 standing ummies.	{ On Bluff. " Yes Tor.
"		
"	ms, 6 limbers, and 42 dummies.	" Blackdown Neck.
"	ms and 3 wagons.	" East Mill Tor.
"	apetitive. 4 gun detachments. 26 dummies.	
"	anding. 15 standing.	
"	100 kneeling.	{ In one series in 1893 the supports were kneeling.
"	neeling dummies in line at 1 pace interval.	
"	ummies in 4 groups, 25 yards between groups, 1 pace be- tween dummies.	
"	anding dummies in line, at 1 pace interval.	
"	ummies.	
"	"	Including Competitive.
"	"	{ " " and under cover.
"	"	Including Competitive.
"	"	" "

Three clinometers, namely, the Watkin with double drum, the German, and a modified Austrian, made in the Arsenal, were tried, the latter appeared most liked. However, I believe that before a final decision is made, a Scott's sight, fitted with an adjustable bubble, is to be tested, in the hope that, if successful, it will obviate carrying an extra clinometer.

THE CHAIRMAN—Gentlemen, we have listened with great interest to this lecture, and we shall now be glad if anybody will start a discussion on any points that have occurred to them. There must be many, I am sure, who will be able to give us the benefit of their experience in certain matters.

AVERAGE RESULTS OF COMPETITIVE PRACTICE.

Station practised at.	Number of Batteries.	Rounds.			Hits.			Marks.				
		I.	II.	III.	I.	II.	III.	I.	II.	III.		
Okehampton— 4-gun average	4	22.5	23.22	24	12.5	49.25	53.75	36	49.5	43	90.5	221.5
6 " "	11	19.63	23.36	23.81	19.09	49.54	45.9	23.09	40.9	44.45	91.54	200.27
General "	15	20.4	23.33	23.36	17.33	49.46	48	26.6	43.2	44.06	91.26	205.93
Glenbeigh— 4-gun average	5	20.6	23.8	24	31.2	157	137.6	51.2	82.2	73.4	93.8	296.3
6 " "	3	16.3	24	24	18.6	194.3	132.3	46.6	80	72.3	94.6	293.6
General "	8	19	23.8	24	26.5	171	136.5	49.5	81.3	71.3	94.1	295.4
Shoeburyness— 4-gun average	4	19	23	24	21.2	169.2	102.7	42	82.5	62	83	269.5
6 " "	12	19.6	22.5	22.6	31.83	122.58	150.36	47.3	73	72.66	89.58	282.59
General "	16	19.5	22.6	23	29.1	134.2	123.4	46	75.37	70.0	87.93	279.31
Morecambe— 4-gun average	1	24	22	24	29	144	93	64	82	78	96	320
6 " "	2	23.5	23.5	24	24.5	124	130	38	64	71	94	267
General "	3	23.6	23	24	26	131	117.6	46.6	70	73.3	94.6	284.6
Lydd— 4-gun average	3	17.3	20.3	21.3	13	39.6	32.6	24	38.66	58.66	89.66	195.0

DISCUSSION.

COLONEL G. H. MARSHALL.—I shall endeavour to make my remarks as brief as possible, because my real object in coming here is to hear what others have to say and to get suggestions for next year; therefore I should like to hear as many suggestions as possible.

I am very glad that Major Hughes touched on the subject of occupation of positions. Whatever method we adopt, obviously it is of the first importance that we should put our guns in such a position that we can see the target over the sights. In the direct occupation, there was, in many cases, much hesitation on the part of commanders in going forward boldly and taking up a favourable position. I think that a good deal of that is due to the teaching that we have had for many years, and it is hard to get out of it perhaps, that cover was the first consideration. That I think was the teaching, not only in our drill-book but in all drill-books. This is now changed, and we are taught (and I think very rightly) that it is the first consideration to be able to hit the enemy, and that cover is of secondary importance. Another matter which, I think, has influenced commanders in that respect is, that they have been impressed by the undue importance attached to the effect of modern long range infantry fire on a battery unlimbering. In that connection I think it will be of interest if you will let me read to you a record of some experiments at Glenbeigh this year of long range volley firing at an artillery target. These are not really "Experiences of Okehampton," but they bear on our experiences there. The strength of the party firing consisted of one officer, three section commanders, and 44 rank and file. The target consisted of a battery of six guns in action, with three wagons, and 40 dummies to represent detachments. In the first series the range was 2515 yards; the time occupied was 17 minutes 50 seconds; the number of rounds fired was 459; the effect was *nil*, but that I discard, as I do not suppose that the greatest advocate of long range fire would say anything about 2500 yards. The second series was at the same target at 1707 yards, time 13 minutes; 463 rounds were fired; the effect on the target was two hits on two men. The third series was at the same target, range 1730 yards. This was not fired against time; I presume the time was unlimited. The rounds fired were 439; the effect was *nil*. In the fourth series the target was an infantry column, 95 dummies; 1750 yards range; no time limit, the rounds fired were 440; there were 30 hits on 30 men. In the fifth series the target was a battery in action of four guns, 27 dummies in the detachments; range 1150 yards; time 15 minutes, 489 rounds; the effect was two hits on two men. In all the series the ranges had been taken before firing commenced. I think that these figures are very interesting. We find that 1830 rounds were fired during the four series (I have left out the 2515 yards series), and that there was practically no effect at all, except at the infantry target. I think, with the lecturer, that we should look from both ends of the range, and I do think that there is a great deal of unnecessary striving for cover from this fire, especially when we find, as the figures tell us, that there is practically no effect.

It is very satisfactory to notice that all the changes which have been made recently, and that are impending in tactics, in drill, and in equipment, are in the direction of simplicity; all field artillery are agreed that, especially in equipment, you must have simplicity. We are within measurable distance, as regards equipment, of having only one projectile (the shrapnel), only one fuze, the shell carried fuzed in the limbers, only one enumeration for everything (in yards), and a very simple and very efficient shoe-brake. I think that with such simplification we may look forward to great improvement in the rate of fire, and in our fire effect, and I hope, at the same time, that we shall keep up the very high standard of fire discipline that we already possess.

COLONEL E. A. OLLIVANT—I think I must have been the officer referred to by Major Hughes, as the one who used mounted orderlies at Brigade Service Practice. If so, I should like to say that in addition to mounted orderlies, each battery had a dismounted orderly in rear of the Battery Commander, so as to avoid any mounted orderly coming into the firing line; and I think that that adds materially to the advantages of having mounted orderlies.

I think that at Okehampton some Battery Commanders are a little inclined to follow what I may term the letter and not the spirit of the book. One sees officers who, even at short ranges, begin by bringing out their range-takers, and ranging with common shell in precisely the same manner as if they were firing at a long distance target, and this, even at a cavalry target advancing rapidly. That, I think, is due to their going entirely by the letter and not considering the spirit of the book.

Then, as regards casualties, we must all of us recognise the very great importance of practising their replacement. A certain amount of confusion takes place when a casualty occurs at practice, due to a great extent to the fact that the Staff Officer touches the supposed casualty, and says: "You are out of action," and nobody knows that this is the case, it is not sufficiently understood. I cannot help thinking that it would be better if we had some system by which we could label our casualties at the moment, by a red label or other mark, which everybody could see. There was a great tendency this year when the Major was shot for the senior Subaltern to take the command; nobody ever thought of sending for the Captain, who was in rear. I should like to add one word on the question of sergeants acting as layers at the Competitive Practice. It appears to me that they have lost a good deal of their interest in laying; now the sergeants have to carry out a considerable part of the instruction in laying, and I think that they might be allowed to lay at one series of the Competitive, which would give them some interest in it. It would be easy enough to keep up the same number of layers, and the chief umpire could choose two out of the three sets when he came on the ground, so that the number of layers would not be diminished, and the sergeants would have a personal interest in the shooting.

MAJOR H. C. C. D. SIMPSON—I attended this summer, at Bousson, in the Italian Alps, the Brigade-division practice of three 9-pr batteries of the Italian Mountain Artillery Regiment, and Major Hughes's statement as to the faultiness of the echelon system of ranging appeared to be fully borne out. Owing to its employment, and the absence of all attempt at verification on the means of the small bracket, the practice throughout, except at a moving target, was very indifferent. One point struck me as worth noting, and that was the custom, whenever the targets represented a battery, of firing a succession of petards as denoting at them a hostile battery in action. This made the ranging, when the small bracket was being found, very difficult, owing to the impossibility of distinguishing the bursting shell from the petards being fired on the target emplacement. The guns, on coming into action, were invariably placed under cover, and not run up into position until loaded, which operation was effected very rapidly, owing to the shell being always carried fuze in the boxes, a detonator merely being dropped into the head of fuze on orders to load being given. The range-finder was rarely used, and when it was, gave most unsatisfactory results. Rate of fire was quicker than ours.

After each series, officers, Nos. 1, and layers fell out for the customary "palaver" on the tactical idea and the shooting, which commenced, first of all, by the remarks of the Battery Commanders (after which Nos. 1 and layers fell in), followed in succession by those of the Major Commanding the Brigade-division, and concluding with the Colonel's critique.

I had previously attended some manœuvres of an Alpine group in the French

Alps, near Modane, and witnessed a 12-pr. mountain battery of the French artillery working in action at a field-day. They used the clinometer much more than we do, but were very slow entering into action—two minutes—partly owing to the clumsiness of their equipment and packing. They carry all shrapnel with the exception of a few melinite for incendiary purposes.

The advance into action, both by French and Italian batteries, over difficult ground was at a very smart pace, owing to the fine stamp of their pack mules, for which the Governments pay a high price.

MAJOR J. McDONNELL—I should like to ask the lecturer whether he thinks that anything would be gained by having the ranging rounds laid by an officer, or by a selected layer. At present the Battery Commanders sometimes are entirely thrown out, and start ranging in a wrong direction, through a wrong elevation being put out, or a round being wrongly laid. If the ranging rounds were laid by selected officers, that risk would be somewhat reduced perhaps. I have been asked to ask that question by an officer who is unable to be present.

CAPTAIN E. W. BLUNT—I should like to say a word for the poor range-takers. I received a rather unexpected impression of the necessity for their employment at the cavalry manœuvres this year. The ground was very undulating on the Berkshire Downs, and it frequently happened that the Cavalry Commander, intending the collision to take place on a certain point, planted the battery, and for some time there was nothing to shoot at; we could see for a minute, perhaps, a mass of cavalry, then they disappeared, and there we were waiting with nothing to do. Then the battery range-takers were set to work to take the range of prominent features on their expected line of advance, and when the cavalry appeared again, that gave us some guide as to what range to adopt. The only feasible way of opening an effective fire at all, appeared to be, to do what the lecturer has rather condemned, namely, to guess the range and fuze. The target stays such a very short time in any one spot, that guess-work is the only way of competing with it, and judgment, assisted by a range-finder, is very much better than unaided guess-work.

MAJOR E. S. MAY—I should like to ask Major Hughes a question on one small point. On page 8 of the lecture, he speaks almost always of short ranges and so on. He says: "At so short a range there is little difficulty in working both together." What range does he refer to as "so short a range?"

MAJOR A. J. HUGHES—About 1200 or 1000 yards.

MAJOR E. S. MAY—Then on page 10 I do not think we are given the range at which these experiments were carried out against the dummies in position, where the results were so good.

MAJOR A. J. HUGHES—I may answer at once that the range of the first line was from 800 to 900 yards.

MAJOR E. S. MAY—Then, again, I think it would be interesting if Colonel Ollivant were to tell us something more about the mounted orderlies, where they came from and how they were trained? I think it is a matter that interests us all very much. We all see the desirability of efficient mounted orderlies, or *agents de liaison*, as the French term them, but the difficulty is where we are to get them, and how we are to train them.

COLONEL E. A. OLLIVANT—I am afraid the mounted orderlies were not trained before the Brigade-division came to Okehampton, and one had simply to take any spare men. The peace establishment of a field battery does not allow one to have permanent mounted orderlies. The only thing that can be done with field batteries is to take any odd men who may be available. The orderlies stand dismounted a few yards in rear of the Commanding Officer, one of them mounts

when called by the Adjutant and gallops along the rear of the line to whatever battery the order is for.

COLONEL G. H. MARSHALL—Did you not always have one orderly from each battery, so that each one knew where to go to?

COLONEL E. A. OLLIVANT—Yes, the 'orderly always went to his own battery, unless it so happened that I wanted to send two messengers too quickly, one after the other.

MAJOR E. O. HAY—Great efforts have been made during the last year or two to train signallers, and I wanted to ask some one from Okehampton, perhaps the lecturer will tell us, what use was made of battery signallers, and with what result.

MAJOR W. N. LLOYD—We should be glad to have Colonel Marshall's opinion on the "deliberate" method. I feel that it is treason to say anything against it, especially as it commends itself to us in peace manœuvres, by reducing the confusion of a battery coming into action to a minimum. But as a method to be practised on active service it is not sound, and does not commend itself to me. Let us for a moment soar above the usual three batteries which we are accustomed to play with; let us imagine we have twenty batteries on active service about to come into position by the "deliberate" method. What happens? First of all we have a staff of officers reconnoitring the ground, followed by twenty Majors and range-takers, then come 60 Lieutenants with 120 layers, making in all an army of over 300 men.

In the *first* battle of a campaign, the enemy might possibly permit this manœuvre to go unmolested, but having taken in the meaning of it, all subsequent attempts at the "deliberate" method would meet with a warm reception. Again, we cannot always expect to find a position sufficiently clear to enable us to lay out our layers deliberately for this method, troops will surely be moving into battle, or to take up their positions which would cause confusion. I wish to draw your attention to the fact that it is not a method in my opinion which would be employed once in fifty times on actual war service, and that we make an error in employing it so frequently in peace time.

We want rapidity of movement in coming into position 49 times out of 50. We want to seize quickly opportunities which may offer themselves from time to time; and I feel convinced that too much use of the "deliberate" method is *not* a step in the right direction.

COLONEL G. H. MARSHALL—I do not know why Major LLOYD should father the "deliberate" method upon me, because it existed long before the present drill-book was introduced. As a matter of fact I rather agree with Major LLOYD. The conditions under which the "deliberate" method should be used are very fully laid down in the drill-book. I cannot exactly remember them word for word, but I think the following condition must exist: There must be a preparatory position close to the firing position; there must be cover, surprise to the enemy must be possible, and the range must be long. If you take the drill-book conditions you will find that the occasions for the employment of the "deliberate" method are rare, and there is no doubt that in many cases officers do not quite appreciate this. At Okehampton they very often used the "deliberate" method when surprise was not possible, owing generally to the nature of the ground. I certainly do not approve of the use of the "deliberate" method, unless the conditions as laid down in the drill-book can be obtained.

MAJOR E. S. MAY—I am afraid I may be opening up rather a difficult subject, but in using the direct method, would you usually take guns slightly down the slope, or would you strive to keep them on the reverse side of the hill or crest? I ask the question because I have heard gunners often unfavourably criticised at

manœuvres, by officers belonging to other arms, for apparently exposing guns and wagons unnecessarily, by placing them somewhat down the slope. Of course it is impossible to lay down any rule applicable to every nature of ground, but, when in a hurry, men are apt to act largely according to habit, and it is as well, therefore, to meditate some normal method. I should say that, in our service at present, the tendency is to get on top, or in front of, rather than behind the crest.

COLONEL G. H. MARSHALL—That is a very large question. I think it is very much a matter of the back-ground, and also the nature of the slope. If you have a very steep slope I should say that it was inadvisable to go down forward into it, because you immediately put yourself into a position to enable the enemy to observe every shell very distinctly. If the slope is a very great one you are rendering his observation of the fire very easy, otherwise I think that the going forward is an advantage.

THE CHAIRMAN—If no other gentleman desires to speak, I will now ask Major Hughes to reply to the remarks that have been made.

MAJOR A. J. HUGHES—With regard to the questions that have been asked, first with regard to what Colonel Ollivant said about casualties, I should think that some label would be a very good thing. Some Battery Commanders adopted the plan of sitting down, or tumbling down, which seemed to answer well, although perhaps it is not very dignified. With a view of getting more practice in regard to casualties, it has been suggested that the Captain should take one of the Competitive series.

As to the suggestion of sergeants laying in one series of the Competitive, several officers mentioned it to me this year during the practice. The only drawback appears to be, that if you have a battery with five sergeants who are layers, and one who is not, it is rather invidious having the other five out and not him.

With regard to what Major Simpson said, as to petards being fired from the target battery, I hope that next year we may use them in a similar manner. This year was the first time that they have been tried, and they were not very extensively used.

As to the French using the clinometer more, that also, I think, is rather the tendency with us. Several reports, that have come in, have suggested that more clinometer laying should be done.

As to what Major McDonnell said about the ranging rounds being laid by an officer, I am sorry that some officers, who have had much experience of actual shooting with a battery, have not given us their opinion; but to me it appears that it would be rather slow. I believe it is done abroad. I saw in some book that in Germany, when the target is difficult to see, one man goes down and lays all the guns for the first round. In such a case, I, myself, should prefer each layer to use the clinometer for elevation, direction being given from the end of the handspike.

With regard to what Captain Blunt said as to range-finding, I did not mean to disparage the range-takers. Certainly, on occasions with a quick target or anything like that, one must accept their range at once. But what I more especially intended to point out was, that with a standing target, like an artillery one, at a long range you must range on it, and only use the range-finder's range as a guide for the first shot.

With regard to what Major May said as to the firing at short ranges and being able to work the range and the fuze together, that was rather with regard to the three series fired at short ranges, which varied from 700 to 1200 yards. I think the nearest was about 700 yards, and the furthest 1150 yards.

As to signallers, I saw very little use of them indeed, except in signalling from the battery to the range party during the elementary practice, and then they were not very successful.

I think that is all that there is to answer. Colonel Marshall having already answered Major LLoyd.

THE CHAIRMAN—Gentlemen, I think there is no doubt that we have run too much in the direction of the “deliberate” system of taking up positions. I agree with Major LLoyd, and Colonel Marshall bears me out, that there has been a mistake in this way. It is rarely, I should imagine, that one would be able to practice it on service, though it is a good system for occasions, and would be most useful when practicable. I think, that when once you are launched in action, you will, as a rule, have to take up positions rapidly, and take your chance as to cover. Most hunting men, when travelling by train, choose their places in the fences, and get over them very easily and successfully, and I think that, in the same way, useful practice can be had by military men, particularly when riding through a country, if they selected positions for batteries, or troops, and then proceed to test them and see what they turn out to be. No doubt we should often be disappointed, and find that what appeared very promising was not so satisfactory as we had expected, but practice would enable us more readily to fix on positions that were good.

I agree with Colonel Ollivant, as far as my experience goes, that mounted orderlies would in most cases be the best way of conveying messages, a mounted man for each battery, and a dismounted man stationed in rear of each battery, seems to me a system that ought to work very well.

I was glad to hear from Colonel Marshall that the tendency now is towards simplicity, and to getting one type of everything as far as possible. The case, noticed by the lecturer, of an Officer Commanding a Brigade-division having to give three different settings to as many batteries, must create difficulties and chances of error, and the sooner that sort of thing is done away with the better.

I do not think there is anything else that I can usefully refer to, but I should like, with your approval, to tender a vote of thanks to Major Hughes for the trouble he has taken and for the valuable lecture that he has given us.

Carried with applause.

ANCIENT BRITISH ORDNANCE

NOW IN THE
ARTILLERY MUSEUM, MADRID.

BY

LIEUT.-COLONEL J. C. DALTON (H.P.), R.A.

DURING a recent visit to Spain, I was once again enabled to pay a visit to the Artillery Museum in Madrid, which, as I have before remarked in these pages, contains a splendid collection of ordnance from the earliest times, in addition to a rare assemblage of military models and curiosities of all kinds, both ancient and modern. The collection is contained in one handsome and spacious building, and is under the charge of a director, with a sub-director and staff, who are officers on full-pay of the Spanish Artillery. The Spanish nation is justly proud of their National Military Museum, and no expense and pains are spared to keep it up to date, and worthy of the distinguished corps which is entrusted with its management. On the occasion of this visit, I had the advantage of being personally conducted over the Museum by my old friend Colonel D. Ricardo Vidal, now employed in the Spanish War Office, but who, until recently, was himself in charge of the Museum. I therefore saw the collection under exceptional advantages. Colonel Vidal pointed out to me, amongst other objects, a very handsome bronze gun, made in England in the reign of Edward VI., and on my evincing great interest in this and in other ancient pieces of British ordnance, he most kindly offered to let me have a descriptive list of the English ordnance in the Museum. I have since received from him the promised list, a translation and brief explanation of which, I venture to think, cannot fail to be of considerable historical interest to the British Artillerist.

1. The oldest English piece appears to be that to which I have already alluded, and which figures in the Madrid catalogue under the number 3937, and is thus described :—

18-pr. demi-cannon, made in the form of a culverin. The exterior is partly twisted and bears in relief on the first reinforce a scorpion, below which is the following inscription :—

*"QVI VITAM, QVI FORTVNAS AMISERAT OMNES LEGVM
ET IVDICIO JAM PERITVRVS ERAT EDVARDI SEXTI
NVNC MVNERE VIVIT ET ILLI POST SVMMVM GRATES
DEBET HABERE DEVM."*

Below this, and in larger letters one reads :—

"Robert and John Owin, bretherin, made this pece, anno 1551."

The gun is of bronze, is 14^{cm} (5½") calibre, and 342^{cm} (11' 2½") length of bore. It has no dolphins. It is not known how this piece came into the possession of Spain.

Major H. C. L. Holden, R.A., has kindly supplied me with both a literal and a rhythmical translation of the inscription on this gun, as follows:—

"One who had forfeited life and all his fortune by legal verdict, and was on the point of being put to death, is now, by the boon of Edward the Sixth, alive, and to him, after the Great God, is bound to owe thanks."



or,


"A luckless wight his fortune lost,
Condemned by law to die;
Now lives to thank his king on earth,
Next to his God on high."

The latin inscription on the gun which, in the original, is somewhat abbreviated after the fashion of the day is, as will be seen, in hexameters and pentameters.

I was much struck with the beautiful workmanship and excellent state of preservation of this gun which, like many of our own old and interesting pieces of ordnance, is at present, lying out in the open air.¹

2. No. 3799 in the Spanish catalogue, is a Falconet, the breech slot of which is closed by an iron wedge (or vent-piece containing the chamber). On the upper side, between the trunnions, it bears the

monogram . In the chamber there are two similar stamps 

and . On the chase is engraved the weight, 107 lbs., and on

the breech, the weight of the breech closing wedge (or vent-piece), viz.: 22 lbs. 8 ozs.

This piece is of bronze, its calibre is 88^{mm} (2·67"), and its length 97^{cm} (38·18"). It was captured from the Cochin Chinese, in the time of Isabel II. of Spain. I presume that this piece dates from the reign of William and Mary, 1688.²

¹ The gunfounders, Robert and John Owen (see "Proceedings," R.A.I., Vol. II, p. 156), lived in A.D. 1538, and are thus mentioned by Stowe:—"About the latter part of the reign of Henry VIII., three brethren that were gunfounders, surnamed Owens, got ground there (in Houndsditch) to build upon, and to inclose for casting of brass ordnance. These occupied a good part of the street on the field side."

In the above quoted number of the "Proceedings," Lieut. Edgar, R.A., describes the old guns in the R.M. Repository, Woolwich, and amongst them there are several pieces made in the reign of Henry VIII. and in that of Edward VI., but none of them exactly correspond with the gun we are describing. "Tomas Owen" (the third of the Owen brethren) is mentioned as maker of a *fawcon* of Edward VI., in 1550, and Robert and John Owen, a brass *fawcon* in 1549, but a much smaller piece than that now at Madrid, which was made two years later. The inscriptions on the two pieces are very much alike.

In Cleveland's notes ("Proceedings," Vol. II, p. 350) we find, "John Owen, gunfounder," mentioned in the list of Edward VI. Artillery, as receiving 12d. per diem, in A.D. 1548.

² I saw a similar piece to this in each of the Artillery Museums at Stockholm and Christiania this year. That at the latter place is a particularly good specimen. The breech-piece (or vent-piece) is hollowed out to take the charge, it is lifted into and out of the slot in the breech by a handle.

3. No. 1286 in the catalogue. Bronze mortar of 93^{mm} (3·65") calibre, with a chamber in shape of a truncated cone (the lesser end being so small that the chamber is almost conical). The thickness of metal is very slight. From the appearance of the bed it is on, it would appear to be in all probability a naval piece. The mortar bed has an eye on the fore-part to hook on to a pin-tail, and an apparatus, the chief feature of which is a toothed arc, by which elevation or depression can be given to the mortar. The fact that the weight is engraved near the vent as 0. 1. 6. 4 (? 1 cwt. 6 lb. 4 ozs.) would seem to point to its being English or Dutch, but whence it came is not known.¹

4. Nos. 3930 and 5748. Two bronze guns of 15·5^{cm} (6·1") calibre, and 312^{cm} (10' 2·8") length of bore. The weight engraved on the chase is 55. 2. 13 on one piece, and 56. 0. 9 on the other. On the first reinforce is the following inscription :—

"By the Rt. Hon. Sir Henry Goodricke,² Knt. and Bart., Lieut.-Genl. and the rest of the principal officers of their Majties Ordnance. Gulielmus et Maria Mag., Brit. Fran et Hib Rex et Regina Anno Regni tertio."

On the second reinforce a *G* and *M* intertwined, surmounted by the Royal Crown. The vent is of iron. It is not known whence these guns were obtained.³

5. No. 3144. English service 12-pr. howitzer, cast in 1827. The British Legion, which fought for Isabella II. in the civil war, had a complete battery of four 6-pr. guns and two 12-pr. howitzers. This piece is supposed to be one belonging to this battery.

6. No. 3635. Cast-iron gun of 14^{cm} (5½") calibre. On the chase hoop there is the number *XI*; on the first reinforce *XVI. II. 0*; on the near trunnion *1778*, and on the off trunnion *VB*. This gun was captured from the Moors at Tetuan.

7. Nos. 3935 and 3936. Two cast-iron guns 14^{cm} (5½") calibre. The off trunnion has on it *18P*; the near one "*Carron 1809*;" on the first reinforce the cipher *GR* and *3* intertwined, surmounted by the Royal Crown and the *Λ*. These guns are supposed to be relics of the Peninsular War.

8. No. 3380. Carronade. On the breech is "*18P Carron 1805*." It also dates from the Peninsular War.

9. Nos. 1 and 2. Two cast-iron guns of 14^{cm} (5½") calibre. On the near trunnion the word *solid*, on the off, *B*. Near the vent *41. 3. 24*; between the trunnions a monogram of the letters *G.R. 3*, surmounted

¹ There does not seem to be any satisfactory evidence to point towards this mortar being English. In Lieut. Edgar's paper, in Vol. II of the "Proceedings," R.A.I., p. 186, there are briefly described two small Dutch brass mortars chambered, somewhere about the size of this: also on page 168 there is a description of a "sort of mortar (brass)" of about this size, which is English.

² We find frequent mention of Sir H. Goodricke (Goodriche) in Cleveland's MS., in the reign of William and Mary. According to Kane's list he was made Lieut.-General of the Ordnance on 26th April, 1688, and probably continued so until 1702.

³ There is in the Tower of London a brass 18" mortar with an inscription on it identical with the above, except that the piece was made one year later. (Edgar's paper, p. 194).

by the Royal Crown. These pieces were captured from the natives in the island of Jolo (Phillippines) in 1851.

10. Nos. 3891 to 3895. Five English service $5\frac{1}{2}$ " howitzers, cast in 1794 and 1804.

11. Nos. 5372, 3857, 3858. Three English service $4\frac{2}{3}$ " howitzers, cast in 1807 and 1808.

12. Nos. 3938 to 3941. Four English service guns, medium 3-prs., cast in 1807.

13. Nos. 3656, 3853, 3855. Three English service light 3-prs., cast in 1807 and 1808.

14. No. 3143. English service 9-pr., cast in 1811. It is supposed that all the above numbers, 10 to 14, date from the Peninsular War.

15. No. 3561. English service heavy 6-pr. In the year 1855, this gun was discovered buried on the field of Talavera. It was cast in 1796, and bears an indentation on the breech from having been struck by a shot.

16. No. 3660. English bronze mortar of 22^{cm} (8·6") calibre. Above the vent is the inscription "*Raby & Co., fecit 1771.*" Above this again is the monogram *G.R. 3*, with the Royal Crown. Its weight is given as 4 \wedge 2 \wedge 0.

17. No. 3689. Bronze mortar 31^{cm} (12·2") calibre, with a cylindrical chamber, similar to No. 16. Copper vent. An inscription, in Spanish, states: "*This sacred Mortar was made in London by order of Sidi Mohamed ben Abdallah, Sultan of Algarves. May God protect him! Fort Suirah (Mogador) year 1184, (A.D. 1770).*" Its weight, as engraved on it, is 4350 lbs. Both these mortars (16 and 17) were captured from the Moors at Tetuan.

18. No. 3631. Another bronze mortar, taken in Tetuan, of 32^{cm} (12·6") calibre, and with cylindrical chamber. There are two dolphins, also a Royal Coat of Arms, with the mottoes "*Dieu et mon droit*" and "*Honni soit qui mal y pense.*" Above is a war trophy with the words, "*Tria juncta in uno*" and "*A Rege et Victoria.*" On the breech is "*W. Bowen, fecit 1764. 25 \wedge 1 \wedge 14.*"

19. Nos. 3639 and 3640. Two bronze guns of 10·6^{cm} (4·1") calibre, and 232^{cm} (91·2") length of bore. On the first reinforce there is the following Arabic inscription, "*By calling on God, victory follows. This is a present made to the Sultan Mohamed ben Abdallah ben Ismael the blessed, defender and pacifier of the Algarves, from the Great Monarch of England, France, Ireland and Scotland, George III., the thunderbolt of war. Year 1183 (A.D. 1769).*" On the breech there is another inscription which reads, "*In the pious name of the God of piety. There is only one God, the eternal, the just. He who shall be chosen and aided by Him will rejoice in Heaven and on Earth. There is no power nor strength but of God.*" Both pieces are handsomely chased and engraved with military trophies, palms, scrolls, &c. They were captured at Tetuan in 1860.

There are, therefore, 34 English pieces of ordnance at Madrid, as above described, besides several minor pieces of later date such as Whitworth and other mountain guns, taken from the Carlists at various times, which it is not necessary to describe.

So far as I could ascertain, many of these pieces have been left behind in the Peninsula by the English during the numerous campaigns which England has waged in that country, others have been captured by Spain in her wars in Marocco, Phillippines, Cochin China, &c., from the natives. Some were presentation pieces, as will be seen, others were probably bought or exchanged by the countries in question. There were none, as far as I could see, of which there was any evidence to show that they had been captured by Spain from England. It would, however, be very interesting to know how the oldest pieces here described came to find a home in Spain ; and especially to know under what circumstances, and by whom the inscription on the gun described here as No. 1 was made. Perhaps some of the readers of this paper may be able to throw light on the matter.

RECORD TARGETS:

BEING A SHORT DESCRIPTION OF THOSE NOW IN USE
AND A COMPARISON OF THEIR MERITS.

BY

CAPTAIN P. E. GRAY, R.A.

It is not many years since Garrison Artillery practice was, by all ranks, regarded as an objectless, perfunctory annual duty. It took place under what are, to our ideas, the very reverse of service conditions, and consisted of a number of rounds, fired off at an anchored barrel, each gun-captain or No. 1 correcting his shooting from his own observation, or by the advice of his Divisional Subaltern Officer.

The ultimate object of the whole practice was attained when the barrel gracefully went to pieces to a well-directed shot.

The Commanding Officer of a battery usually undertook the duty of judging the Rights and Lefts.

The results of each round were signalled up from the range-party, firing ceasing to allow this to be done.

The more barrels that were expended, the better was the practice. Instruction was comprehended in the destruction of as many barrels as possible.

The idea of carrying out annual practice on a recognised scheme, directing the fire of a fort by the orders and will of one officer, who would observe and correct the shooting for himself, and on his own judgment; who would hold the fire of his command, as it were, in the hollow of his hand; in short, the instant, quiet, and effective application of what we now call Fire Discipline in Coast Defence, was not even thought of.

There were thoughtful officers of Garrison Artillery, no doubt, who remarked, after a more than usually impressive display, at the expense of the long-suffering barrels with their flags, that, though magnificent, it was scarcely an example of Service Practice; for what enemy would ever stand still and allow himself to be shot to pieces, unless his ship was sinking?

A naval officer would hardly attempt a regular artillery duel with forts, by anchoring his own ships and giving the enemy every possible chance against him. The practice at anchored targets was no doubt excellent as a means of testing the eyesight of layers; and by way of accustoming the detachments to concussion and noise, it was everything that could be desired; but, as a preparation for attack by an enemy's enterprising and swiftly moving ships, cruisers, and torpedo-boats, endeavouring to run past with an ulterior object in view, the practical instruction of the annual practice was *nil*.

So, grew up, tentatively at first, more rapidly as its vast importance became recognised, that branch of applied gunnery which is known as Coast Defence; and in its train came into being, as necessary adjuncts, specialist gun-layers, depression range-finders and their uniform and effective use, groups and group differences, Commanding Officer's observation and corrections, moving targets, schemes of practice, strict Fire Discipline, and Record targets.

Record targets are designed to represent actual ships, and to travel at a fair rate of speed.

Hong Kong
target.

The forerunner of the Record target was the single or double Hong Kong, which is still far the best bad-weather target we have. It is cheap, handy, and extremely light. Used singly it represents any desired position of a ship, usually the bow, and hits are counted as the shots fall within given limits, laterally, and in range.

It is usually taken to represent the bow water-line, because layers are instructed to invariably aim at that point. If the Fire Commander knows that this is being done consistently, he can himself then correct, with confidence, to bring the shots to any desired point of impact.

Two Hong Kong targets, connected by a tow-rope, represent the length of a supposed ship. All shots, within limits, falling between the two are counted as hits.

The objections to the Hong Kong are its small size, which renders it difficult to see at long ranges, the impossibility of its recording effective hits, for if it represents the bow water-line—a shot through would be far less effective than one 50 feet astern of the target. It is also liable to tow under, nose-first, when turning, and in rough weather, owing to weight of tow-rope. This may be prevented by using an ordinary square cork buoy, made fast to the tow-rope between target and tug.

Dismissing, then, the Hong Kong, useful and seaworthy as it is, we come to Record targets proper, which are required to fulfil the following conditions, or as many of them as possible:—

- (1.) Visibility at long and short ranges.
- (2.) Every hit to be recorded.
- (3.) Strength.
- (4.) Seaworthiness.
- (5.) Lightness in towing.
- (6.) Cheapness, in first cost and repair.
- (7.) Durability.

Portsmouth
target.

One of the first was known as the Portsmouth pattern target. It was a long, narrow boat-shaped body, having an iron centre-board keel at the stern, and a superstructure of light iron masts and tape lattice-work. Its length was over 60 feet, its breadth at water-line about 3 feet, and its height 12 feet. It towed remarkably well, but was very heavy, very expensive, and could be dismantled by one or two lucky shots.

It was cut clean in two at Plymouth by a shot at water-line; and the bow portion was used for some time alone, until it was again cut in half by a similar shot.

A target called the Devonport or Richardson pattern was then invented. Devonport
or
Richardson
target.

It was designed to illustrate the breadth, as well as the height and length of a war-ship, and to offer the same target area when not exactly broadside-on to the battery.

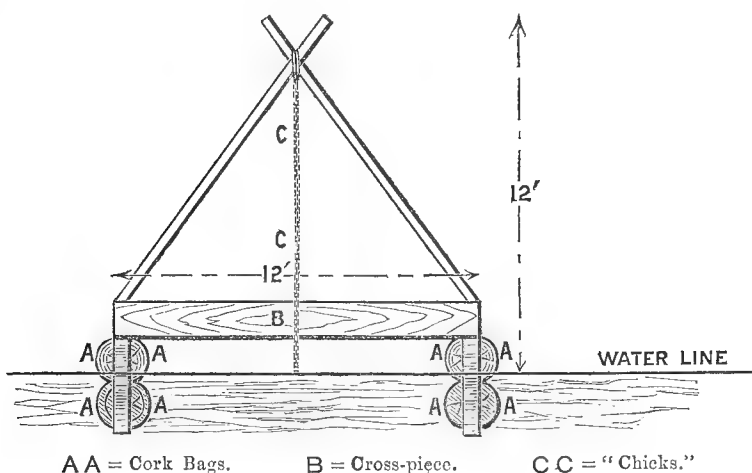
It was built in such a manner that no one shot could pass through it without leaving a record; but no single shot could do any extensive damage.

Light wooden cross-pieces and lathing were built up upon two keels, 12 feet apart. These were fitted with bags of cork chips to give the necessary buoyancy.

The structure resembled the frame of a house-roof, was made of the lightest deal scantling, and from the ridge-pole hung "chicks" or curtains of laths, strung on tape, which could be rolled up when not required. The length of target was 40 feet, its height above water-line 12 feet when new, but as the cork bags became water-logged, it sank deeper.

An end view of this target was somewhat as follows:—

DEVONPORT OR RICHARDSON TARGET.



It was cheap and easy to build, and at first it answered well, but as the cork bags became thoroughly soaked, the cross-pieces B, of which there were 10, entered the water, and the resistance they offered was so great that towing at a fair rate of speed was out of the question.

The original target was found to be too unwieldy in one piece, and a second pattern was designed, in two sections, connected by lashing and stays. This was rather handier, and the sections could be used separately in very rough weather.

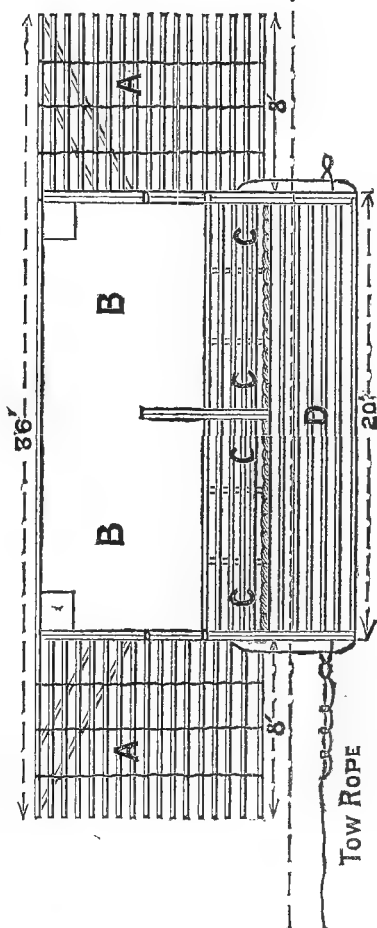
The great objection to this target altogether was its difficulty in towing, on account of the cross-pieces, which difficulty has been overcome in the target known as the "Improved Richardson 1893 pattern." Richardson,
improved,
1893 pattern. Major-General Richardson so far altered the design of his first targets that the cross-pieces should be well clear of the water.

The cork bags also offered considerable resistance, and these were very ingeniously disposed of, by making each keel double and stowing

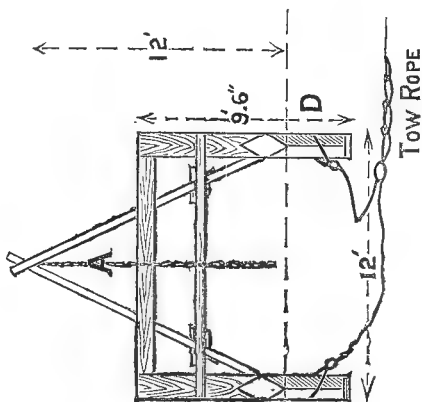
within its interior spacing the bags of cork chips, the ends of each keel being built into a cut-water.

RICHARDSON RECORD TARGET.

Side Elevation.



End Elevation.



Scale - 10 feet to 1 inch.

A A = "Chicks," or Tatties. B B = Tarred canvas. C C C = Cork bags. D D = Floats or keels.

The cut-water at either end was continued up to a height of 6 feet, with a similar upright in the centre of each keel. These uprights formed the main supports of the structure. Cross-pieces at their tops connected them, and also at a height of 6 feet 6 inches from the bottom of keels. In addition to these, there were four uprights from each keel connected by cross-pieces and forming knees at a height of 6 feet 6 inches. The whole of these frames were constructed of deal scantling, 6 to 9 inches by $1\frac{1}{2}$ inch.

Upon the floats themselves was built up a framework, covered with tarred canvas, stretched down to the tops of floats, and from each projecting end depended a "chick" of laths and stout twine.

The extreme length of target, including "chicks," was 36 feet; the canvas roof being 20 feet long, each top corner painted white. The target area for fire effect was 432 square feet. The keels or floats being 3 feet in depth, and the cross-pieces connecting the uprights being 6 feet 6 inches from the bottoms, all parts, except those running in the direction of movement, were at least 3 feet clear of the water—a very great advantage.

This target is cheap, seaworthy, and tows lightly. It records every hit, and can be severely punished before it becomes disabled.

The Mitchell pattern target consists of a pair of long, narrow boats, placed parallel, and 10 feet apart. They are divided into water-tight compartments, and are covered in with tarred canvas. Its particular feature is the steering apparatus, which is ingenious.

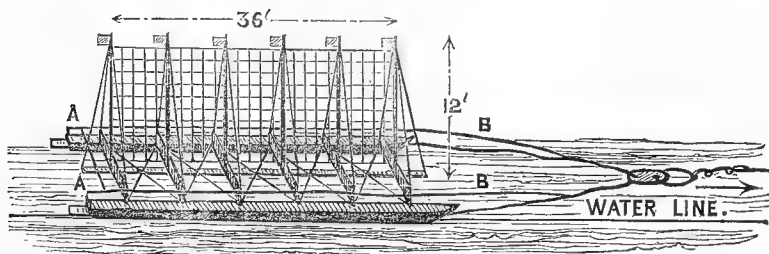
Mitchell
pattern.

At the stern of each boat is a rudder, whose tiller is connected to the bridle by yoke-lines—the two tillers are connected by an iron rod. The bridle runs freely through a rounded wooden float, to which is fastened the tow-ropes. As the tow-ropes veers, the float slides, carrying with it one or other yoke-line, thus steering the target into the wake of the towing steamer.

The superstructure, resting on wooden cross-pieces, about $1\frac{1}{2}$ by 8 inches, of deal, and on edge, consists of light wooden masts, carrying a lattice-work of cotton webbing.

The tops of masts are ornamented with small flags. The length of target is 36 feet, and height above water-line is 12 feet.

MITCHELL TARGET.



A A = Tillers.

B B = Yoke-lines.

The above is a rough hand sketch only, and is not drawn to scale. This target answers fairly well as a record of hits, but has the fail-

ing, common to all webbing targets, that a shot may carry away a mast, and with it the whole of the webbing "bay," making an aperture through which subsequent shots may pass, leaving no record of perforation. It is also awkward to hoist in and out of the water without straining.

The writer has seen a single shot, 'twixt wind and water, completely wreck this target.

The boats, if perforated, are certain to settle down, which brings the cross-pieces into the water, and makes the target most difficult to tow.

Wooden buoys are provided to place at intervals along the tow-rope. They make it awkward to handle, and have not been used at this station as it is often an advantage to allow the rope to sink a few feet, and so permit a fishing boat to cross between the launch and target.

The Ryder
Target.

The Ryder pattern target is cheap and simple in construction.

It consists of two long, narrow rafts of flat timber, pointed at the ends, and connected by flat wooden cross-pieces. It is in two sections, fastened together by chains and lashing.

The superstructure is of the usual lattice webbing type, supported on eight wooden masts and iron rods.

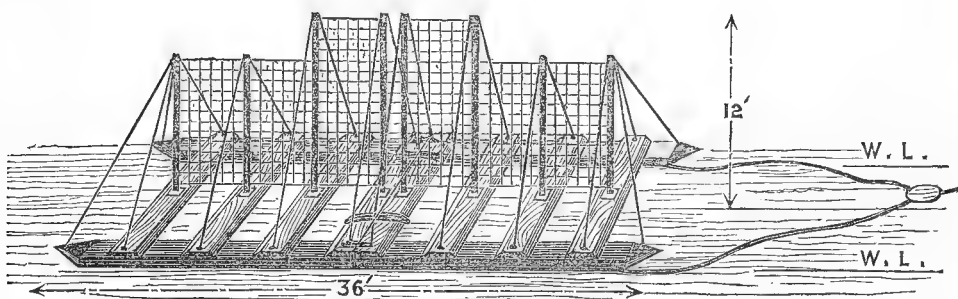
It tows well and easily, and its being in two sections gives elasticity, and flexibility in riding over heavy seas.

Its greatest disadvantage is, that a single shot cutting the two centre masts will cause the whole two sections of webbing at the centre to collapse.

A direct hit on water-line, also, cuts cleanly through the rafts, almost invariably through both, as has happened more than once this season at Plymouth. Its length is 36 feet, and height above water-line is 12 feet.

The annexed rough hand sketch is not drawn to scale.

THE RIDER TARGET.



In presenting the above notes, the writer puts them forward with no claim to originality, the details of these and other Coast Artillery targets being, no doubt, well known to Garrison Artillery officers.

He presents, however, the foregoing short description of those Record targets now in use, in the hope that it may not be uninteresting to some officers who have not had the same opportunities of seeing them used and comparing their points.

The late Commandant of the School of Gunnery, Major-General

Richardson, laid down as his opinion, that the use of Record targets, which Coast Artillery should be encouraged to hit, is the best training for actual warfare, when every hit can alone be effective, and every miss but serve to encourage an enterprising enemy.

On one occasion only has the writer seen the Richardson target disabled. It was struck 8 times in 12 rounds, being hit repeatedly on the angles of cross-pieces, and having the ridge twice cut through. The sea was rough, and it was blowing a whole gale of wind in squalls; the target gradually opened out, collapsed and turned over, the only portion which was saved being the two floats.

It was as severe a test, from wind, waves and fire effect, as could possibly occur to any target. Its final disappearance was almost inevitable, and few targets could have lived as long under the circumstances.

An indestructible Record target remains still to be invented.

DIARY
OF
CAMPAIGNS IN THE PENINSULA,
FOR THE YEARS 1811, 12, AND 13,
BY
LIEUTENANT WILLIAM SWABEY,
AN OFFICER OF
"E" TROOP
(PRESENT "E" BATTERY),
ROYAL HORSE ARTILLERY.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

INTRODUCTION.

THE favourable reception accorded to the recently published "Diary of a Cavalry Officer," induces the belief that the narrative of his services during the campaign in the Peninsula, under Lord Wellington, by Lieutenant W. Swabey, Royal Horse Artillery, may be found equally instructive and entertaining.

Through the kindness of Lady Bowman, daughter of Lieutenant Swabey, who served in "E" Troop from 1807 to 1820, I have been lent and authorised to arrange for publication, the diary kept by her father during a portion of his service in the Peninsula. It embraces the period between July, 1811, and August, 1813.

Lieutenant Swabey, in after years, appears to have written his reminiscences of some of the events in which he was concerned, adding amusing accounts of adventures not touched on in his diary; I have introduced these in their chronological order, placing them between brackets, so that the recollections of later years may not be confused with the daily record.

For the better comprehension of the narrative, I have divided it into separate parts and chapters, prefacing each part with a brief outline of the general military situation at the time, as gathered from the Wellington despatches, Napier's history,

and other authorities, and have appended footnotes explanatory of the history and services of officers incidentally mentioned in Lieutenant Swabey's pages. A summary of the principal events of his life has been kindly sent me by his son, the Rev. Maurice Swabey, and is as follows :—

William Swabey was born in Doctors Commons, London, on the 13th of June, 1789. He was the third and youngest son of Maurice Swabey, of Langley Marish, Bucks, D.C.L., Fellow of the College of Advocates, and Chancellor of the Diocese of Rochester. His early education was received at Westminster School and the Royal Military Academy at Woolwich. On the 1st of July, 1806, at the age of 16 years, he received a commission in the Royal Regiment of Artillery, and, in 1807, was present with Captain Cockburn's No. 7 Company, 1st Battalion, in the land force which co-operated with Admiral Lord Gambier at the bombardment of Copenhagen. He was ordered in July, 1811, to the Peninsula, with "E" Troop, R.H.A., and served in it during a considerable portion of the war. He was severely wounded at the battle of Vitoria and invalided home, but rejoined the army before the close of the war. He was present at the battle of Toulouse, and, marching through France to Calais, returned home in 1814 with the troop, which the following year he accompanied to Belgium and was with in the retreat from Quatre Bras, and at the battle of Waterloo. He received the Peninsular and Waterloo medals. Shortly after promotion to the rank of 2nd Captain, he retired, in March, 1825, from the service and settled down in Buckinghamshire, where he became J.P. and D.L., and captain of a troop of Bucks Yeomanry Cavalry.

In 1840, he emigrated with nearly all his family to Prince Edward's Island, of which his friend, Sir Charles Fitzroy (an old Waterloo officer), was then Lieut.-Governor. Captain Swabey continued in the colony till 1861, and developed such capacity for the management of public affairs that he became, successively, a member of Her Majesty's Legislative and Executive Councils, Registrar of Deeds, Commissioner of Crown lands, and member of the Board of Education, besides undertaking latterly the duties of Lieut.-Colonel and Adjutant-General of the local Militia. It is scarcely too much to say that the Statute book of the Island is full of useful measures which he either initiated or promoted in his adopted home. When the Prince of Wales visited the Colony in 1860, Colonel Swabey was one of the two Military Aides-de-Camp to the Lieut.-Governor, who received from his Royal Highness's own hand a fine portrait of himself, in recognition of their services. Colonel Swabey was entertained at a public banquet in the Colony and presented with a flattering address, signed by the heads of departments and many other prominent inhabitants, on his return to England in 1861. He was also allowed to retain for life the prefix of "Honourable," which was a privilege limited to those members of Council who (prior to the Union, about 1867, of the North American Colonies) had received their appointments under the sign manual of Her Majesty the Queen.

Captain Swabey married, in 1820, Marianne, third daughter of Edward Hobson, of Somerly, Hants, and Hope Hall, Lancashire, Esquire, and had a family of eleven children. He died on the 6th of February, 1872, having, towards the close of his life, resided for some years at Wavenden House, Bucks, a county endeared to him by family ties and early associations.

A few words as to "E" Troop, R.H.A., may not be amiss here. It was formed on the 1st of November, 1794, and in 1811 was stationed at Christchurch, under the command of Captain Robert Macdonald, in July of that year it was ordered on its first active service, and embarked at Portsmouth to join the army under

Lord Wellington in the Peninsula. The establishment was as follows:—2nd Captain Thomas Dyneley, Lieutenants Robert Newland, Robert Harding, and William Swabey, Assistant-Surgeon A. Macdonald, M.D., 164 non-commissioned officers and men,¹ with 175 horses. The armament was light 6-pr. guns.

In 1816, after the termination of the long continental wars, various reductions and changes took place in the Royal Artillery, and "E" Troop became "D," when the troop that had hitherto been so-named was reduced. It retained this letter till a reorganization in 1859, called the Brigade System, changed the designation of all units in the Regiment; further alterations followed, until at the present time, 1st of January, 1895, it exists as "E" Battery, Royal Horse Artillery, commanded by Major J. McDonnell.

PART I.

THE LATTER PERIOD OF THE CAMPAIGN OF 1811, TOGETHER WITH THE 3RD SIEGE OF BADAJOS.

Summary of the Peninsular Campaign, from September, 1811, to April, 1812.

It was at the latter end of September, 1811, that "E" Troop joined Lord Wellington's army, which then lay in the vicinity of Ciudad Rodrigo, for the reduction of which place secret preparations had long been in progress. The French army under Marmont lay at Salamanca, and it was from this point that interruption was principally to be apprehended. But in December the welcome news arrived that Marmont had detached three of his division to assist Marshal Suchet before Valencia, and the favourable opportunity for commencing operations was at once seized. The siege was begun on the 8th of January, 1812, and on the 19th Ciudad Rodrigo was carried by storm.

This successful attack was followed by the yet more daring attempt in the south, to reduce Badajos. By a rapid movement, therefore, the main body of the army crossed the Tagus at Villa Velha, and marched on Elvas. Soult, on learning this, advanced towards Badajos, upon which Generals Hill and Graham were pushed forward to oppose him. As on the previous occasion at Rodrigo, the siege was hurried on, ground was broken on the 17th of March, and to the mortification of Marshal Soult, who was within two marches and ready to fight an action for its relief, Badajos was taken on the 6th of April. On the news of its fall, he at once returned to Seville, which in his absence had been blockaded by a Spanish force.

A few days after these events, Lord Wellington heard that Marmont was committing great depredations in the northern provinces of Portugal, he, therefore, at once marched back with the bulk of the army. The French, who had been stoutly withstood by the Portuguese Militia, on his approach withdrew from Portugal.

¹ 2 Staff-Sergeants, 3 Sergeants, 7 rank and file non-commissioned officers, 7 artificers, 1 trumpeter, 84 gunners, and 60 drivers.

DIARY.

CHAPTER I.

Voyage to Portugal. Sacavem. Some account of Lisbon. Changes in troop equipment.

July 27th, 1811.—Having been on board the *Benjamin* and *Mary*, transport “K.I.,”¹ since July the 3rd, we sailed from Stokes Bay under convoy of the *Mercury*, Captain Tancock, and the *Hawke*, brig, Hon^{ble} Captain Gordon, but our wind failing us we came to an anchor in Yarmouth Roads, much to our disappointment. As we lay here the beauty of the coast of the Isle of Wight and of Hampshire, might have pleased the imagination at any other time, but served now only to remind us of the happy scenes we had left, a thought which not all the airy dreams of glory could extinguish.

28th July.—Passed without any of the ceremonies of religion. The cruelty of the foul wind still occupied our thoughts, and the surrounding scenes, with the ball-room at Lymington, so often the scene of pleasure, actually in view, awakened the same ideas as yesterday.

29th July.—Weighed anchor in company with the *Quebec* and *West India* convoy with a fair wind. Passed through the Needles with eyes fixed for a last view on the various well-known spots of Christchurch and its vicinity, where lived those particular friends whose society had always so great a charm for me, and the remembrance of past pleasant days formed a melancholy barrier against the high spirits I might otherwise have felt at the prospect of a favourable passage.

30th July.—We found in the morning that our progress during the night had been rapid, and we now saw the coast of Devonshire, at too great a distance, however, to discern its romantic beauties. Towards mid-day our wind failed, and left us to the tossing of the waves, many of the people in consequence of the motion were sick. If this is “soothing with its lullaby,” I hope lullaby will be good enough to leave me to the chance of my own slumbers. I, however, felt no inclination to be sick. Towards night the breeze, still fair, freshened, and we saw the last of England. I should not omit that I hemmed the whole side of a silk handkerchief to-day, and that we dined off two mackerel that we had previously caught with our lines.

31st July.—We had a fair breeze during the night, but the day again saw us becalmed with the same swell as yesterday acting as a stomachic. I begun now to regret that my stock of books was gone

¹ Compared with the merchant vessel of the present day, ships of this period were very small. “Those trading” between Great Britain and the United States averaged from 200 to 250 tons; those to the West Indies and the Baltic about 250; to Germany, to Italy, and the Western Mediterranean, 150; to the Levant, 250 to 300, with some of 500 tons. The East India Company’s ships were larger, “averaging 500 tons;” (Mahan, “Influence of Sea Power, 1793 to 1812,” page 225, Vol. II). Transports for carrying troops on the expeditions at the beginning of the century were of the former class, usually under 250 tons, and consequently very numerous. In the official lists they were always quoted with their tonnage, and, so to avoid confusion, were mostly distinguished by letters in preference to numbers.—*F.A.W.*

through whilst we lay at Stokes Bay. I amused myself, however, by making up silk handkerchiefs. The calm continuing in the evening, we began to apprehend a tedious passage.

1st August.—This day passed with the usual sameness on board ship, it began, however, to get rough, and the wind blew from an unfavourable quarter. We spoke a convoy from Lisbon, who informed us that the armies had gone into cantonments, an unpleasant piece of news, as we now suppose operations are concluded for the present. Wind towards evening still more foul. We were to-day under the necessity of giving up tea because the water was bad. The Sergeant-Major reported many sick, and almost all squeamish; little burgoo¹ eaten amongst them.

2nd August.—A great deal of motion this morning, with a contrary wind, and we found on getting up that the Commodore had made the signal for putting about and retracing our steps to Falmouth, a very mortifying sort of business.

“But, hark! the signal bids us trace again
Our steps to England, and the adverse wind,
Controlling e’en the mighty-swelling main,
Compels once more the nearest port to find.
Thus ’tis in life, few certain blessings shine,
And those but rarely, fully, understood.
Oh man! in vain thy choice, thy best design
Vain, as the Bark opposing Nature’s flood.”

We now sail at nine knots an hour, and arrived off the romantic coast, near Falmouth, at 7 o’clock a.m. As we looked from the sea, Pendennis Castle, on an elevated promontory, commanded the harbour. A fort below it, some height above the water’s edge, with one on the opposite side, facing each other, command the entrance. The appearance of the cliffs is black, with ravines in every direction; the crops at this time of the year, various in colour, alone bespeak it an English coast. In several places on each side of the harbour the sea runs beautifully between the hills and forms various lakes. Altogether, it is as striking a scene as I ever beheld, and though not wild enough for Swiss or American scenery, it partakes of their beauties in a more polished form. As the *Trusty*, Captain Macdonald’s transport, was bringing to, a Bombardier Cochrane, being on the anchor, unfortunately fell over and was drowned. He swam for some time, but the ship being under weigh, a boat could not be lowered with sufficient expedition. This poor fellow’s fate is the more to be lamented as he had recently purchased his discharge, but on hearing the troop was for service, immediately joined us again; as a soldier, he is a great loss.

3rd August.—Remained on board, not being able to procure a boat, though we much wanted to get some fresh meat. The funeral of poor Cochrane took place at Falmouth Church to-day, we attribute his death to the erroneous way of treating him when taken out of the water. The men who were in the boat held him up with his head down for the water

¹ Burgoo, a kind of oatmeal pudding, or thick gruel, used by seamen.—*F.A.W.*

to run out, the most effectual method of smothering, perhaps, ever contrived.¹ This observation is worth recording, as the hurry of people in their charitable endeavours is very often a bar to their reasoning on the best way of making them effectual. Sergeant Wightman,² who was very active in getting ready and in lowering the boat, was so haunted by the scene that in the night, fancying himself still in it, he was seen pulling in his cot, and calling to everybody to pull. . . .

4th August.—This morning went on shore to Falmouth. I was much disappointed on nearer acquaintance. Its white, or rather brown, brick houses, and the fact of its being built on the side of the hill, had given it from the ships a too favourable appearance, for its streets are both narrow and dirty. I should say, however, that for poultry and all sea stock, particularly goats, it is the best and cheapest place I ever heard of. I walked up to Pendennis which commands a noble prospect of the sea, and opposite, the old castle and village of St. Mawes and the surrounding country. There appear to be few gentlemen's seats in this part of Cornwall. Pendennis Castle is famous for its having successfully opposed Oliver Cromwell, for which service some of the neighbouring Cornish boroughs received their charters, and elective franchises. It appears, however, that the safety of the garrison was owing more to a singular accident than to their resolution, for, having dispaired of holding out longer, they were preparing to retreat to their boats on the sea side, and out of bravado flung over the walls two

¹ It is a common and time-honoured practice among sailors to this day, to hang a half-drowned man up by his heels.—*F.A.W.*

² Sergeant James Wightman was a very gallant soldier, and had a distinguished career. He entered the R.H.A. in 1797, went with "E" Troop to the Peninsula and was present at Ciudad Rodrigo, Badajoz, Salamanca, (where he laid the gun which wounded Marshal Marmont just before the battle), and at Vitoria. In June, 1813, he was promoted Sergeant-Major to "F" Troop, and was present at Nivelles, Nive, St. Sebastian, as well as many minor affairs during the war. At St. Jean de Luz he was wounded in the left leg, and specially mentioned on the occasion by Major Webber Smith, R.H.A. He received the Peninsular medal and 7 clasps.

Sergeant-Major Wightman, who was a disciplinarian, was with his troop at Waterloo, and lost his right arm by a cannon shot. It is related that on this occasion one of the men exclaimed, "D——n that marksman," for which language he was tried by a court-martial, but was forgiven, as he pleaded that he used it hastily in his sorrow at seeing the Sergeant-Major wounded. Wightman, when taken to the rear, underwent amputation of his arm at the same time and place as Lord Anglesea his leg, who never afterwards forgot him.

Though a one-armed man, he was eventually appointed Brigade-Sergeant-Major, R.H.A. Lieut.-Colonel Sir Augustus Frazer commanding, and who presented him with a sword, saying, "he preferred him to any other N.-C. officer." Wightman was both a good equestrian and swordsman, he was an excellent fencer, and at stick and basket few could beat him, and he assisted to bring out the new sword-exercise of that day, at which time, with other picked mounted men, he attended the riding establishment then at Pimlico, and also Angelo's fencing-rooms in London. In 1821, he was mainly instrumental in getting up a gymnasium and small sword school in a room over the stables, near the Riding-house at Woolwich. This may be said to have been the parent of the present gymnasium establishment in that Garrison.

Wightman was appointed a Lieutenant of Invalid Artillery in 1825, and as Quarter-Master, R.A., accompanied the expedition to Portugal in 1827. He was appointed, in 1848, a Military Knight of Windsor, where the same year he died and was buried.

He had a son who died as a Staff-Sergeant, R.H.A., and another who for many years served as an officer in the 11th Hussars. Lieutenant Wightman had also two grandsons, who served in the Crimean War—one, in the Scots Greys, died of cholera; the other, in the 17th Lancers, was wounded and taken prisoner in the Light Cavalry charge at Balaklava, and who wrote in 1892, in the May number of the *Nineteenth Century Magazine*, a very graphic description of his experiences on that day.

In November, 1891, a picture (now in the R.A. Institution), taken in 1821, of James Wightman when Brigade-Sergeant-Major, R.H.A., riding a horse that was at Waterloo, was presented to officers of the Royal Artillery by his son, Major J. T. Wightman, late 11th Hussars.—*From Record of Service and Family papers.*

quarters of beef. The besiegers had supposed them to be nearly starved, as in fact they were, for this was all the provision they had; but now, believing their supplies were good, immediately raised the siege.¹ This story I take to be traditional. As to the present importance of the Castle, it is a good defence against the entrance of hostile shipping, for it has on its works, as nearly as I can remember, having no memorandum book, 20 long, heavy 24-prs., four ditto carronades, and three 42-pr. carronades. There is below, a fort mounting nine 24-prs., which faces the fort of St. Mawes on the opposite side. In the present improved state of military knowledge, the Castle would be an easy conquest from the land, as the ditch from its narrowness, and the fact of its being dry, might be easily passed by escalade, and could from the nature and rapid fall of the ground be approached nearly under cover. To batter it *en brèche* would never be attempted, as its great height would render such an attack useless. It might, therefore, be tenable with a good garrison well provisioned: its intention at this present time is, of course, to keep off invading ships

5th August.—Still a foul wind. Went on shore, hired a horse and rode to see one of the copper mines not more than eight miles distant from Falmouth. The way was hilly and the roads rocky and bad, the country, however, extremely wild and beautiful; and as we rode along we several times had occasion to say "Well, the views at least recompense us for our trouble if the mines will not." We passed no gentlemen's seats worth remembering, and there appeared to be few large farms—at least, few houses I should think suitable for a dignified gentleman of that class if nearer London. The face of the country was fertile, and though covered with rocks and large pieces of stone, was not stony, and the soil was rich. There is much slate and many quarries. The names of the places are all Welsh. The people here, as at Falmouth, are uncommonly ugly, and the cottages mean and wretched. They carry their geese, etc. to market on a pack-horse. On our arrival at the mines, through a village called "Comfort," I suppose to express the delightful insides of the houses, we found a captain of the mine, an intelligent man, who was to be our bear leader.

The first operation was to strip entirely, and put on a flannel dress and pair of shoes for the expedition. We then descended, carrying candles in our hands, by a perpendicular ladder through a hole just big enough to admit our bodies upright.

This was the shaft of the steam-engine, which is the largest but one in England, its force being 500 horses, with a 63-inch cylinder; it raises the water from a depth of 70 fathoms, and has several stages to facilitate repairs in this length. When we arrived at this level we descended by a rope, about 30 feet lower, into an excavation little bigger than our bodies, from which some of the copper ore was being dug. We then branched off into some of the road drifts or passages driven to cross the veins of ore above the water-level. They are scarcely high enough to stand upright in, and in several places we

¹ Pendennis Castle, which was built by Henry VIII., was besieged by the Parliamentary troops under General Fairfax, in 1646, and taken after a siege of several months—*F.A.W.*

crawled on our hands and knees. The whole sight of a copper mine consists in these passages, there being no large excavations as in coal and other mines. From three adits¹ in various places there are holes to the surface of the ground, through which whims or windlasses, worked by two horses, lower alternately two baskets capable of containing each 3 cwt. of ore, which is thus got rid of when dry. The deepest adit of the mine is 140 fathoms, and extends, from a centre about a mile, every way. The engine raises a hogshead of water at every second or vibration. In the adits, and in the descent by the steam-engine, the damp drops on you like rain, and in several places you have to walk through channels that convey the water, which runs very rapidly and is up to your knees, from different parts to the engine. Owing to this perpetual damp and the stagnation of air, miners are consumptive, and, as they told me with great coolness, few live to more than 40 years old; occasionally the damp² strikes and immediately kills them, if it does not actually do so, it incapacitates the person from holding on to the pump-rods³ in the descents, when they fall to the bottom, and their fate is inevitable death. I had been led to suppose that miners were the most uncouth wretches on earth: these were not so, and in general the Cornish tongue appeared to have less of the provincial than is usual in distant counties. The names are certainly original. The great curiosity of the mine was the steam-engine, which is certainly one of the most wonderful products of mechanical knowledge, in the rest I was disappointed.

The mine is called the "United Mine," and was worked constantly for 80 years, then closed for nine, and was re-opened two years ago. Its return is £5000 per month; much money is sunk however, in clearing the water; till that is effected it cannot be so profitable. It employs 300 people; when the water is gone they tell you it will employ 5000. The men work only six hours a day, that being as much as the constitution can bear.

We had excellent hacks from Falmouth. The party consisted of the two Lyon's, Taylor, and myself, and the day passed pleasantly enough; indeed, it was a sort of release from prison. We got to Falmouth for supper at 10 o'clock. The time passed so quickly at the mines that, though intending to be back to dinner, we stayed there till half-past eight; we all brought specimens of the different ores. Tin is likewise found. The metal is not prepared here, but sent by land to some place, of which I forget the name, in South Wales.

[When we left Hampshire a gentleman, about my own age, attached himself to us as a volunteer. Alas! poor fellow. Having run through a handsome fortune, he has been long dead. He was a gallant spirit; his father used to say that there was nothing by day or by night that

¹ Adit, the opening by which a mine is entered, or by which water or ore is carried away.—*F.A.W.*

² The carbonic acid gas which is present in all mines.—*F.A.W.*

³ The pump-rods in Cornwall are fitted with standing boards, and a man going down steps off the pump-rod at the bottom of the stroke on to a fixed stage, where he stands till the up-stroke is completed, he then steps on to the rod and descends with it to the next stage, and so on till he reaches the bottom; it will be understood that if the damp or gas does not suffocate, it may render a man incapable of maintaining his hold, when he falls to the bottom and is killed.—*F.A.W.*

he and I were not ready to undertake. He would run all over the rigging with the sailors, and he maintained (he was an excellent scholar as well as a Brasen-nose man) sometimes very strange opinions concerning various things. I do not know now whether he supported his opinions mathematically or no. He would have it that a man could get his whole body through any place into which he could put his head. To illustrate this, we persuaded him to put his head into a round hole in the upper bulwarks of the transport, designed for some 3-pr. swivels; this he did with good success, but not finding the diameter of his head equal to that of his body, he could get no further, and strange to say, he could not get back again, for his nose was compressed as he went through, but could not be brought to consent to his return, and there he might have remained, ever and anon swallowing a briny draught as the vessel stooped to leeward and threw up the foaming spray, had not he been most scientifically sawn out by the ship's carpenter, but not till he had undergone a salutary lesson in patience, and promised all the engagements which the man chose to exact from him!

It was rather singular that he was not the only volunteer with us. Two gentlemen, brothers, with whom I had been at school, and who had an intimate friend amongst us likewise, came to Lisbon, intending to accompany our steps. The eldest went out of his mind, and the younger one got him back to England as soon as he could. It was thought well to let the latter follow his own bent, and a commission was procured for him in a Dragoon regiment. The very first skirmish the poor fellow was present at, only a few days after joining the regiment, he was killed!¹ I have often thought his friends owed us little gratitude, though they always took a lively interest ever after in our concerns.]

6th August.—We were obliged to remain on board all day again for want of a boat. Harding, and Bridges,² who was on his way to Cadiz in the *Royal Yeoman*, the very transport I sailed in down the river from Copenhagen, dined with us

7th August.—We went to Falmouth this day, where we met Captain Deacon of the East Kent, formerly of the 1st Battalion, R.A. We dined at the inn

8th August.—Dined on board "S.K.," Dyneley on shore.

9th August.—Left Falmouth early this morning. In getting under weigh, being to windward of No. 15 transport, we ran foul of her and carried away her quarter-piece and sprung her mizzen-mast. She, however, put to sea. We lay-to off the harbour for some hours for the rest of the fleet to come out, wind N.W. and very rough: though not dangerous, the motion was very unpleasant, and the noise kept me awake the greater part of the night; we found we were ourselves the only landsmen not sick. N.B.—Wrote a letter to Maurice, but having no pilot could not send it. The *Flame*, brig, in which my horses are em-

¹ William J. Lyon was appointed a Cornet in the 14th Light Dragoons on the 23rd April, 1812. He was killed in an engagement near Lembege, in the south of France, on the 18th March, 1814.

² Lieutenant E. J. Bridges, R.A.

barked, sprang a leak at sea before we put back to Falmouth, which detained us from sailing once before when the wind was fair. . . .

10th August.—To-day we were obliged to breakfast on deck, holding fast by the ropes, and nothing would stand on the table at dinner. Newland having been in bed all day, we attempted to dine in the cabin. The first ceremony was that the whole dinner, with the two servants and myself, went bodily to leeward on the floor. I kept fast hold of a chicken by the leg, and we fell to without knives and forks! Newland all the time in his cot. I think I have not laughed so much since I left Christchurch. Being at sea in such weather is to some people perfect misery, but a little difficulty is always to me more seasonable than a life of ease, unless I can choose how to pass it. Every soul was desperately sick, except ourselves and Sutton¹—so much so, that Burgoe was not cooked, the men had not stomach to eat it. We waived tea this evening, not because we were not hungry, but because the kettle got upset in the caboose and put the fire out. . . .

11th August.—The night passed in rolling and pitching in a violent manner, in the morning the wind was more moderate, and towards evening became almost calm, so we began to doubt the quickness of our passage, with the expectation of which we had hitherto consoled ourselves. A brig, one of the convoy, had her main-top-gallant-mast carried away this morning. . . .

12th August.—A dead calm, which is not the pleasantest state of weather for impatient people. In the evening, being near the *Trusty*, rowed to her in the boat and drank tea: found even that bold campaigner, the Doctor, had been sick. Whilst we were there we saw large shoals of a small sort of fish jump, or rather fly, out of the water, pursued by some larger species. We took them, from the length of their aerial excursions, to be flying-fish, but the sailors, though inclined to think the same, called them "skipjack." I should not have doubted their being flying-fish, but could perceive no wings. . . .

13th August.—Lay in all the dullness of a calm, not motionless, but without wind. Rowed in the evening to "S.K." and drank tea, and in the evening took a lesson in surgery, in consequence of young Lyon putting out his shoulder in getting up the rigging; fortunately the *Dominique* was near, and a surgeon was procured without much difficulty.

In the morning read many of Lord Chesterfield's letters, apropos of which I have only to remark that I am glad my passion for fashionable life, as a pursuit at least, is over, and I am thankful that so much pains was never taken to make me substitute the *finesse* of a courtier for the more honourable feelings of the heart. . . .

14th August.—Last night a favourable breeze sprang up and we made considerable progress, and so on through the day. We saw at some distance a grampus, but not near enough to give any idea what sort of a gentleman he was.

¹ His servant.

More of Lord Chesterfield: who would be a courtier must be a dependent, flattering knave.

15th August.—We made the coast of Portugal, and the *Jasper*, with her convoy for Oporto, left us. We now expect to be at Lisbon to-morrow. Last night though not so rough certainly produced more motion in the ship than we have yet had; it blew a complete gale of wind. We were under fore and main topsails all night, and sailed at seven knots.

I read some chapters of the "World," which do not go down after the "Spectator," notwithstanding that Lord Chesterfield, Sir H. Walpole, and Mr. Jenyns were contributors.

16th August.—Within 100 miles of Lisbon we are becalmed and delayed; my patience, hitherto pretty submissive, now begins to be consumptive, and I fear is very short-lived.

17th August.—Still becalmed with varying winds. Read more of Moore's "World," from a selection of the best papers published by somebody who thought proper to prefix a very pretty frontispiece, and then very wisely to write an anonymous preface, in which he declares himself annotator. How he could suppose himself capable, after drawing a foolish frontispiece, in no way emblematical of the subject of the book, of adding his remarks to those of the celebrated authors of these periodical essays, I am at a loss to divine. Still, as a knowledge of the world is the best ingredient in a compilation of advice for its reformation, perhaps his remarks on life had taught him that there were fools enough who would purchase a book with a pretty engraving to recommend it, and so, on second thoughts, I find no reason to doubt his competency.

18th August.—Beating to windward with an adverse breeze, the last duck slaughtered, and the last ebb of patience gone.

19th August.—Towards night made play with a favourable breeze, hoping to be at Lisbon before September. Read Dryden's play of "Love for Love," Otway's "Orphan," and "Venice Preserved." I was disappointed in the first, it is tame of plot and incident, and the language does not compensate for these defects. The tragedies by Otway, as classical productions, are far superior; there is more spirit in the dialogue, and they are better suited for theatrical representation.

20th August.—Sailed on our course with a favourable wind, and saw from the "top" the plains of Vimiera. In the evening saw some flying-fish which, on enquiry, are called Serinas,¹ and were pursued by the Bonito.

21st August.—Passed the rocks off Mondego Bay, and came close to the rock of Lisbon, which forms a barrier on the side of Ciuira; there is, however, between it and the city landing space for a large army: great pains have been taken to oppose this by the construction of forts in proper situations; the principal one is called Cascaes. We then passed into the mouth of the Tagus, where there are, on the left as

¹ Flying-fish are rarely found out of the tropics, but many fish will make long springs out of the water when pursued by others.—*F.A.W.*

you enter, two channels for ships, defended by St. Julian, which is not cut out of the rock as described, but built on its top, and has seven bastions, and, constructed on a sand in the middle of the river, there is a ravelin entered by foot-bridges, beyond which the shoals prevent the passage. Our pilot, who had been on board all night and was the first specimen of a Portuguese, told us that under the bridges were dungeons for the confinement of criminals. As we sailed on, the tower and works at Belem formed, with the opposite heights of Velha, another line of fire to prevent ships from sailing here.

Lisbon opened on our view standing majestically on a declivity of a hill like an amphitheatre, its appearance was grand, every building, of which there were many fine ones, appearing to advantage. We anchored off the dockyard of the Arsenal, and our transport immediately began to disembark horses,¹ and the detachment, as soon as formed, was marched under the Sergeant-Major to Sacavem, eight miles up the course of the Tagus. It is singular that no platform is built large enough for more than one ship to unload at the same time when so many horses are landed at Lisbon. One tide will only bring alongside two, or if small, three transports at most, so that a regiment of Dragoons may be five days disembarking, there being two tides per day. Newland and I, after seeing the horses off, found out Lieutenant Saunders,² who was sick, and dined there at seven o'clock in the evening. Our return to the ship was truly ridiculous, as when we wanted a boat neither of us could make ourselves understood. After trying French and German for some time, I at last met Monsieur le François, who procured us one. The difficulty then was to direct the people, but our friend, the Frenchman, at last made them understand that I was to hold the helm and they were to row, by which arrangement after much search, we reached our destination on board "K.I.," where we slept. . . .

22nd August.—Was employed from 4 o'clock in the morning till 7 o'clock at night, without even resting for refreshment, in disembarking horses and stores. Dyneley, Harding, and Newland marched off the parties, as soon as completed, to Sacavem. I took up my abode in a billet with George Willis,³ after getting some supper at the Mess.

23rd August.—I was employed in the early part of the morning, assisted by a party from the barracks, in getting the guns mounted and marched off to the Arsenal, where they will undergo some alteration. I went to dine at an hotel at "Buenos Ayres," the best part of Lisbon, and most frequented by the English. I went afterwards to the Salitre, National Theatre, where the entertainment, as is the custom, consisted in dancing and opera performance, neither of which were at all worthy of notice. Though neat and well painted, for the Portuguese excel in rough scene painting, the house is badly constructed, the sides being rectangular, so that you must constantly turn your head in order to see

¹ It is strange that, in this voyage lasting 50 days, no mention is made of the troop horses, we must conclude there were no casualties. Sacavem was a dépôt for receiving troops on arrival in Portugal.—*F.A.W.*

² Lieutenant W. Saunders, R.A.

³ Lieutenant G. B. Willis, R.A.

the stage, which becomes very tiresome. Nor does the interior of the boxes at all correspond with the grandeur of the outside, as they have only one bench in front, which seats but four people, and does not incline to the stage. I expected, of course, to see all the beauty and fashion of Lisbon, but looked in vain, the *senhoras* having little to distinguish them from the women to be seen on foot in the streets. Their dress is exceedingly plain, and, doubtless, if there are any pretty women in Portugal, they have been enclosed in the convents.

As to Lisbon, the part which was built after the last great earthquake¹ by the Marquis de Pombal, the then Minister, might be called fine, were the streets clean. The houses, plastered to resemble stone, are of an immense height and have many storeys, each, except in the grandees palaces, holds a separate family, and they have filthy habits. The other parts, which are not of the Marquis's construction, are filthy in the extreme, the stench so great that, in spite of manners on first arriving, one must hold one's nose, and the streets are so intricate that it is extremely difficult to find one's way. Notwithstanding the constant intercourse with England, I was surprised to find no hotel that could deserve the title of decent, though the one at "Buenos Ayres" might indeed be an exception. The people are indolent and filthy to a degree scarcely credible, and though there are wells and springs in almost every direction, they have no method of getting the water by pipes into their houses, but must send for it in casks, and they even hawk it about the streets as we do mackerel. The people at my hotel are very unwilling to let me drown myself in it, and are surprised at an Englishman who may have been taught the use of water, as well as of soap and towel. In the houses which are lighted by lamps there are no fire-grates, only stew-pans and chafing dishes, in which they burn charcoal. Their cookery consists of a vile jumble of oil and onions, very unpleasant to an English stomach; they, however, almost compensate for it by the fruit, the chief kinds at this time of year being grapes and water-melons, and every sort of fruit that we have in England, except currants and gooseberries. I think our English melons and peaches much finer. I dare not buy much as yet, as the money has so many subdivisions that it takes some time to know its value, and I am told that the people are great hands at cheating and stealing.

Being now on the subject of Lisbon, I must mention that everybody of condition keeps a carriage drawn by two horses or mules, it has shafts or poles with two or four wheels, with a leather curtain that draws up in front in the place of windows, and holds two, or three people, if stuffed in as we sometimes go to a ball in England. These

¹ The 1st of November, 1755, will ever be a memorable crisis in the annals of Europe, and especially of Lisbon. In that city, which then contained nearly a quarter of a million of inhabitants, a brilliant morning sun was shining on the papal festivities of All Saints' Day. At 11 o'clock the celebration of High Mass at 30 churches was quenched in universal collapse. The earthquake was sensibly felt all over western Europe, northern Africa, and even in the West Indies; but the catastrophe wrought its climax in Lisbon, where the convulsed bed of the Tagus lifted for some minutes all its shipping high and dry, to be overwhelmed immediately after by a reflux rush of waters, which fairly turned the harbour-quay bottom upwards and then swallowed it out of sight. Of the thousands of fugitives who had sought safety at that spot, and who thus went down quick into Hades, not a corpse ever rose to the surface. The loss of human life in the city was estimated at 30,000, and the loss of property at £95,000,000. "House of Cromwell" (James Waylen), p. 114.

"concerns" are of various degrees and can only be described by the pencil, but some of the principal people have a chaise with four wheels and glass windows drawn by four horses. The drivers are the greatest part of the curiosity, in cocked hats, long queues, and high military boots, but, to do them justice they drive well, though slowly; indeed, the hills in the streets oblige them to acquire this habit, and as the pavement is all of what is called with us Scotch pebbles, Mr. Buxton's rapidity would soon pitch a barouche on its beam ends. I drove in a hired carriage to avoid the heat, which is intense and unremitting. These are like hackney coaches, and are to be had when it does not rain, which it has not done here for four months.

The billet Willis is in, is the common run of a gentleman's house here, and consists of a small bedroom within a sitting-room, full as usual of fleas and all detestable vermin, so that it is next to impossible to sleep. The two or three men who remained to be with me and the guns were so annoyed in the barracks that they preferred lying out under their carriages. I went to-day to the Marquis of Pombal's house, now the residence of Mr. Stewart, our *Chargé de Affairs*, a quarter where the houses, as is usual among those of the nobility, are very grandly painted and ornamented with gilt and glasses, some of them being entirely flat and yet appearing to be carved, from the excellence of the canvas painting, and this one is the best, because the most recently-built nobleman's house in Lisbon, and has a tolerable stone staircase. The paintings and ornaments, generally, are in imitation of marble, and some parts are beautifully paved with the same sort of tile that we have in an English dairy, but superior, and having a good effect. In the houses in general, for instance the one where the Artillery mess, the fault consists in its having no staircase or passage, one room opens into another through a door in the corner, and so on. The rooms themselves are magnificent, though not always arranged with taste, and never with comfort.

Some of the men are fine, stout, fellows, and generally have fine eyes and good teeth. With the exception of the labourers, one can scarcely discriminate between the degrees of people, most of them wearing rusty cocked hats, some with servants behind them. I have not yet learned the difference between monks and friars,¹ &c., but there are many of them idling in the streets. I should observe that the extreme number of cripples and most oddly deformed persons is quite surprising, and I am told that the mothers even deform their children by way of ensuring them a provision by charity. The aged are numerous—so much so, that I am inclined to think that people decline here early in life. There are no hospitals, except the temporary military ones, to be seen. They have a regiment of police tolerably soldier-like in their appearance, and the other regiments that I meet are as well as can be expected. I saw a string of recruits chained together under an escort, these they called *volunteers* for the army, but they do not release them till they reach the dépôt.

¹ A friar is a brother of any religious order, but especially of the four mendicant orders, viz.: Franciscans (gray friars), Augustines, Dominicans (black friars), Carmelites (white friars). Monks and friars are equally bound to vows of poverty, chastity, and obedience.—F.A.W.

24th August.—I was employed in getting the guns conveyed from the barracks to the Arsenal, a work of no small difficulty on account of the scarcity of horses, a brigade having been just fitted out and sent up the country. Horses of middling value, worth £50 in England, are sold here for £150, mules frequently for £80.

25th August.—Was to have dined at Mr. Stewart's, the Ambassador's, but was taken by Captain Macdonald to the Arsenal, from whence we get camp equipage, two store carts of a new construction, leaving our own behind, and a new forge cart of a different pattern, having a gun-limber and lighter perch. The splinter-bars of the guns and carriages are to be shortened for defiles, a box is to be put on every carriage for stores, and the rear left box of each ammunition wagon is to be fitted to carry 10 additional rounds of case shot. I dined in the evening, in company with Captain M., with young Maxwell,¹ who is left behind sick at Lisbon, and for the first time saw the ceremony of a procession of the Host, which is carried amid a long train of priests to the residence of anyone who is not supposed likely to live. It is of course meant to represent the omnipresence of the blessed Trinity, but I cannot separate an image as a symbol of that sort from my ideas of idolatry. From another point of view, as the ceremony is not performed at the request of the sufferer, it appears a good invention for an heir to frighten a rich testator to death. . . . ,

26th August.—Gunners Hollowell and Dean and two drivers, all with dysentery, and Gunner Thomson with the ague, came in this day from Sacavem sick, and were ordered to the Ordnance hospital. The Portuguese are such thieves that some of them employed in the Arsenal took off the claw hammers from several of our guns.

I dined at the Mess, and went to the Ruade-Condés theatre, the performances here consisted of a short farce, of the merit of which, not understanding the language, I regretted that I could form no opinion, the rest of the entertainment was similar to that at the Salitre. I had a better opportunity of criticising the dancing, being admitted behind the scenes. Its merit consisted in a forced agility without grace, the effort of mere strength, one man, indeed, who is an Italian, had some idea. I have scarcely a right to judge, as the Opera company having lately followed the fortunes of their Prince to Brazil, their theatres are only the Astley's of Lisbon. The Fandango was danced, which I think highly disgusting.

27th August.—Captain Macdonald found me employment in the morning at 4 o'clock. On my way to the Mess-room, which, by-the-by, is in the house of the Marquis de Lalle, who has been proscribed as a traitor and his goods confiscated, I walked into the church of Santa Mariska, where was being performed some grand festival, at which a Roman Cardinal officiated. The music, a full band with the organ, was the greatest treat of that sort I ever enjoyed—so much so, that I preferred it to my dinner; the vocal part convinced me, without further enquiry, of the inferiority of our Opera, as they had many assistants

¹ Lieutenant John Maxwell, R.A.

from the Patriarcal band. The church is beautiful beyond description, and rich with gilt ornaments and images in costly dresses, with pearls and diamonds. Colonel Fisher,¹ who has great taste in architecture, justly remarked that the ornaments were heavy, but the altar-piece and canopy to the figure of Aaron above the altar are very superior in taste as well as magnificence. All the different altars were lighted with numerous wax torches, before these the religious prostrate themselves and remain transfixed, as it were, and motionless. It is impossible to dive into the heart of man, but from beholding them you would pronounce them decided idolaters, and surely the ignorant part of society can know very little of the subject which they adore in image, and, I fear, address their devotions only to the outward form, but I should be uncharitable not to add that there is an earnestness in their deportment which is at least becoming. The Catholic service is performed by the priests in Latin only, and can in no way be edifying to the people who cannot understand what is meant; I own I was almost tempted to cry in pity for their ignorance. I conceive the true worship of God to be a spiritual service, whether it is a Roman Catholic or a Protestant that humbles himself before Him. The beauty of this church induced me to go into several others, some of which were the chapels of Nunneries, and I heard the fair prisoners singing from behind the gratings; surely it was something more than fancy that brought their voices to my ear with but a melancholy sound. Those, indeed, that I heard were of a very rigid house, that of La Concepcion; in some they are allowed to visit their friends when sent for. All the churches I entered were rich in the extreme, the plunder of these alone might even have satisfied the rapacious Junot, who levied during his stay great contributions on Lisbon.

The Duke of Abrantes seems not to have been wanting in consideration for the people of Lisbon. "An extraordinary contribution of four millions sterling, decreed by Napoleon, was demanded under the curious title of a ransom for the State, but the sum was exorbitant, and Junot prevailed on the Emperor to reduce it one half. He likewise, on his own authority, accepted the forced loan [levied by himself on entering Lisbon], the confiscated English merchandise, the Church plate, and the royal property in part payment; yet the people were still unable to raise the whole amount, for the Court had before taken the greatest part of the Church plate and bullion of the kingdom, and had also drawn large sums from the people, under the pretext of defending the country: with this treasure they departed [to the Brazils], leaving the public functionaries, the army, private creditors, and even domestic servants unpaid." Napier's "History of the War in the Peninsula," Vol. I., p. 142.

28th August.—Newland came in from Sacavem, and I heard the sad news of the death of a leader of one of my guns, which gave room for me to reflect how positive I had been in recommending him to be kept, but we cannot always be right.

¹ Lieut.-Colonel G. B. Fisher, Commanding R.A.

29th August.—Set out early for Sacavem to sit at a court-martial on Gunners Highton and Taylor for selling necessities; Driver Joseph Dean, for insulting a Portuguese family; Chapple, for being absent from stable duty; and Macmullen, for being drunk on parade and speaking improperly to Corporal Hedge. This is my first excursion into the country, the roads are paved nearly all the way to Sacavem in a very rough and disagreeable manner, and it becomes necessary when one asks the distance one has to travel to know likewise how long it will take one to go.

The houses and gardens in the suburbs have a very different appearance from those in Lisbon, being clean, the latter neatly walled and laid out in grape walks, which form generally a continued arbour all round them; they are stocked with peaches, strawberries, and good vegetables, which, however, require constant care and watering. In each garden there is a well with a wheel, round which turn pitchers, that lift the water as they rise, and when they turn at the top, discharge their contents into a trough or stone reservoir. The grain is now cut; there is some Indian corn standing and orchards of olives, which trees, except in leaf, exactly resemble pear orchards in Herefordshire, and are generally fenced with loose stone walls or rows of aloes which grow very large here, and form an impenetrable barrier. In the gardens there are arbours formed of a species of tree similar to box or myrtle, containing seats, with fish-ponds and regular *parterres* edged with box. The flowers now in bloom, which are planted alternately, are the convolvulus and balsam. I have as yet seen no hot-houses, though I suppose it is possible to have grapes all the year round.

30th August.—Returned to Lisbon with Taylor, who dined with me. I renewed my acquaintance with Captain Webb of the 4th Dragoon Guards (my step-mother's nephew), whom I found at Sacavem.

31st August.—Wrote to Kate and Mr. Walcott, and afterwards went to the church of St. Roque to see the mosaic picture. The church is most splendid, containing, besides the High Altar, 10 chapels. To give an idea of the richness of Catholic churches, I minutely took down notes of one of the richest chapels, which were as follows: the footsteps to the altar, porphyry; the base or part on which it stands, granite; the slab itself studded with amethysts, its edges granite. The pillars to support the canopy are *lapis lazuli*, their bases alabaster. A slab on which stand the candles above the altar is cornelian, the door-posts to the entrance of the chapel entirely of verd-antique.¹ For the furniture on the altar, besides the candlesticks of silver, there are two beautiful candelabra or claws with various devices in silver gilt, and two pieces of alabaster in the form of butterflies with expanded wings. The front of the altar, a representation of the offering of the Lamb, is in silver on *lapis lazuli*, and it alone cost 30,000 dollars. Above the altar-piece is the mosaic picture of the Pentecost, on one side the Annunciation, and on the other the Baptism of our Saviour. Everyone knows what mosaic work is, but few have an opportunity of conceiving to what perfection

¹ A green porphyry used as marble and called oriental verd-antique.—F.A.W.

it may be brought, since it even requires one to ascend a ladder and examine them to know that these pictures are not on canvas. The floor is in devices of mosaic. All the parts are richly covered with gilding, and the whole chapel cost 300,000 crowns.

I afterwards dined with Taylor at the English hotel, intending to go to Belem, but could not stir him after dinner.

1st September.—Rode with Willis to Belem, where I saw the Prince's riding-school, in which I was disappointed, the painted ceiling being very common, and the shape of the school defective, being too long and ill calculated for its intended use. We went then to the Museum of Natural Curiosities, which is small and very deficient in specimens of insects and animals, the minerals and fossils are good, and the collection of birds and reptiles well arranged. The Portuguese certainly understand stuffing animals better than we do in England, and with fish, which are here preserved in a manner I could hardly conceive possible, they are particularly successful. From the museum we went to the Queen's garden. The plants, annuals, &c. that come under the description of garden flowers have few variations from the English kinds. There were some shrubs, which I did not know, and in a conservatory, all the Brazilian exotics, forming a fine collection and needing no hot-house.

In the evening we saw a grand procession of priests carrying about the Host, and attended by some soldiers; the canopy and the image of St. Vincent, which formed part of the cavalcade, were very rich, music playing all the while. Thermometer 87 degrees.

2nd September.—Early dinner with Captain Macdonald, who was endeavouring to procure quarters for Mrs. Tonym,¹ who had come from England to find her husband.

3rd September.—Rode all over Lisbon to purchase different articles that my foresight had not provided for when I left England, particularly portmanteaus, without which an officer's baggage might as well be at home.

4th September.—I went in company with George Willis to Sacavem, meaning to remain there. I found very comfortable quarters in the cleanest house I had yet seen in Portugal, with a large garden well supplied with vegetables of every description, and grapes of every sort in abundance. Strawberries, I remember having said, were not cultivated in the country, but in this garden there were some beds; it was watered by means of a wheel turned by an ox, as are almost all gardens about Lisbon and elsewhere.

5th September.—Was up at 3 o'clock with the intention of shooting, but waited on the bridge in Sacavem a full hour for daylight, and after walking till the heat of the day stopped us, only found three birds, which got up out of shot. I could not help recollecting the many pleasant hours I had passed when I went to shoot last year in the month of September.

¹ Wife of Captain Charles W. Tonym, 48th Regiment.

6th September.—George Willis left us, Newland and Dyneley were both very unwell with flux,¹ the former, however, made a most excellent rally.

7th September.—Went to Lisbon by order of Captain Macdonald, to inspect my new guns, and on arriving after two hours' riding in the most terrible heat I ever remember, found they were not ready. Dined at the Mess in Lisbon, which place I was very happy to leave in the evening. I started back with Newland, but about half-way I found I had forgotten some medicine I had undertaken to bring to Dyneley, and so was obliged to turn back, and then perform the journey alone; no very pleasant job, eight miles in the dark over a rough, stony, road in a foreign country, the way unknown to me. I, however, arrived safely.

8th September.—Remained quiet at Sacavem, not sorry for the opportunity.

9th September.—Paraded at 4 o'clock in the morning, and marched to Lisbon to bring our new guns from the Arsenal, the day excessively hot, and the dust very tormenting, returned to Sacavem by 3 o'clock.

10th September.—Employed from 4 o'clock in the morning till 7 at night, packing our ammunition, and otherwise preparing for the march.

11th September.—This day passed in a similar way to the last, with the additional adventure of a wagon's getting over the bridge of boats at Sacavem; the horse was, however, saved by the timely assistance of men from the barracks. Some horses joined, 22 in number from the artillery drivers, and 17 mules; likewise 22 horses and some men for the R.H.A., who are with the army. N.B.—From Lisbon, at Sergeant Bradley's gun, four round shot wanting.

¹ Diarrhoea.

(To be continued).

A METHOD OF CALCULATING THE PROBABILITY OF COAST DEFENCE FIRE.

BY

MAJOR R. M. B. F. KELLY, R.A.

IN the *Rivista di Artiglieria e Genio* for June 1894 there is an interesting article on the method of calculating the probability of coast defence fire against moving objectives entitled, 'A contribution to the study of the probability of fire of Coast Artillery.'

I began a translation of this but found when I came to the calculations and tables that the results for Italian guns with their method of observation, ranging &c. would be of little interest or use to our service, and besides I could not quite agree with all the bases of calculation in the Italian article, factors of probability for instance having been omitted. I have therefore taken my idea from the article above quoted and worked it out so as to correspond as far as possible with English systems.

The problem is as follows. Granted a Range Finder¹ and system of working it and the guns, by means of which predictive firing is possible, and assuming that although the course of the objective will neither be in an absolutely straight line nor traversed at a constant speed, yet, that during short intervals of time the course will be practically a straight line and constant in speed, that is to say, the changes in speed and direction will not be so frequent as to make predictive firing impossible. What should the percentage of strikes be at various ranges for various speeds of objective?

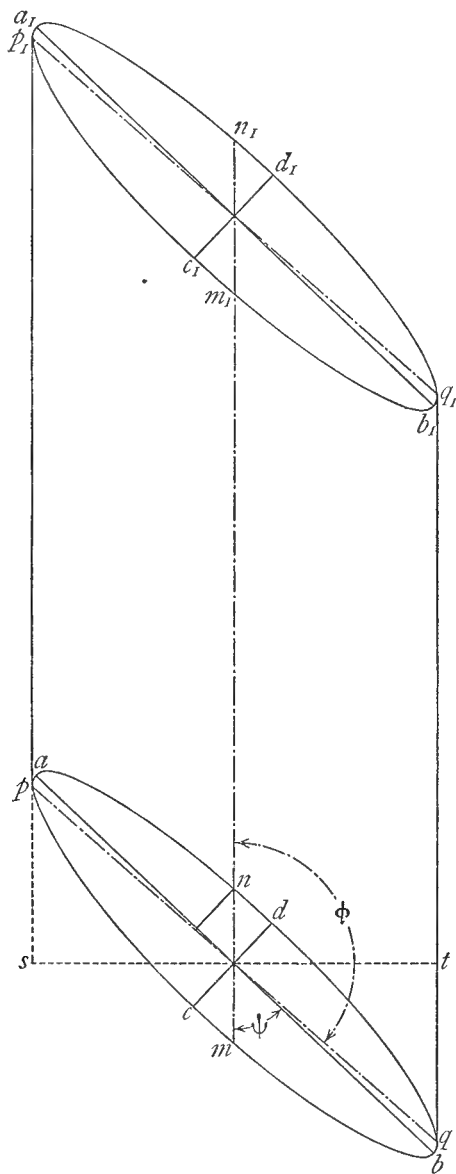
The result arrived at will be the maximum under the most favourable circumstances, when no errors beyond those inherent in the instruments, guns and ammunition occur.

The article I have referred to commences with a long discussion on the possibility of predictive firing, but as that forms the basis of our system of fire control, I do not think I need reproduce it in this article. I think we are prepared to admit, that if we have observed the path of a ship for a certain time we can fairly predict her range or her position at the end of another short space of time.

¹ Or Position Finder.

The steps necessary to calculate the percentage of effective shots one may expect at a moving objective are

(1) to reduce the objective to an equivalent horizontal area or target having a certain length and breadth, which will vary with (a) the gun, (b) the height of the gun above the sea, (c) the range, (d) the dimensions of the objective, and (e) its path;



(2) to calculate the modifications necessary in the dimensions of the 50 per cent. zones when firing under ordinary conditions at a moving objective;

(3) to compare these dimensions with those of the target.

(4) By referring these results to a probability table to find the percentage of shots that should fall in the length and in the breadth of the objective thus 'projected' on to the horizontal plane.

(5) From this to calculate the probable percentage of effective shots.

The area of the horizontal equivalent of the target presented by a ship will depend on

- (1) length, breadth, freeboard of ship;
- (2) gun used;
- (3) height of gun above sea level;
- (4) range;
- (5) angle of approach.



The outline of the ship may be considered to be an ellipse whose axes are the length and breadth of the ship.

Let $acbd$ be such outline, let L and l the axes of this ellipse be the length and breadth of the ship, h its freeboard.

θ the angle of arrival of the projectile, i.e. angle of descent for range + depression angle.

ϕ the angle which the line of fire mn , makes with a , b the length of the ship.

Let $a_1c_1b_1d_1$ be another outline of the ship parallel to the first at a distance mm_1 dependent on θ and h .

Draw pp_1 , qq_1 tangents to the two ellipses; the area equivalent to the target is then the space $pmqq_1n_1p_1$, and this space may be considered equal to a rectangle whose length A is mn_1 , and whose breadth B is such that the area of the rectangle will be equal to the area $pmqq_1n_1p_1$.

The rectangle AB can be calculated from the properties of the ellipse.

$$A = \frac{L \times l}{\sqrt{l^2 \cos^2 \phi + L^2 \sin^2 \phi}} = \frac{h}{\tan \theta} \dots \dots \dots (1).$$

$$B = \frac{\frac{\pi}{4} L \times l \frac{h}{\tan \theta} \sqrt{l^2 \cos^2 \phi + L^2 \sin^2 \phi}}{A} \dots \dots \dots (2).$$

Now supposing the ship were stationary and the firing carried out with the same accuracy as when firing to obtain the length M and breadth N of the 50 per cent. zones, the percentage of effective shots could be found by working out the values of $\frac{A}{M}$ and of $\frac{B}{N}$, and referring them to a probability table such as is found in the Appendix to McKinlay and multiplying the two percentages together; thus, if $\frac{A}{M} = 4$ (taken as 100 per cent.) and $\frac{B}{N} = 1$ or 50 per cent., the percentage of hits would be 50 per cent., or, if the value of $\frac{A}{M}$ gave 75 per cent.

and of $\frac{B}{N}$ 40 per cent., the percentage of hits would be 30 per cent. But when firing under ordinary conditions and at a moving target other errors besides those inherent in the gun itself come into play. M and N would become larger in value than the length and breadth of the 50 per cent. zones.

We have now to calculate the dimensions of the 50 per cent. zones or the probable longitudinal and lateral dispersion of shots fired under ordinary service conditions and at a moving objective.

If two or three causes affect the accuracy of the shooting of a gun each one of which taken by itself would produce a certain probable error, the total error when all are acting together is found by the expression

$$E = \sqrt{e_1^2 + e_2^2 + e_3^2 + \&c} \dots\dots\dots (3).$$

Example: if the probable error of a gun fired as for range and accuracy test at a certain range is 10 yds., and if a particular gun layer lays with a certain normal error, which at that range would produce a variation of 20 yds., the resultant error from these two causes would be

$$E = \sqrt{10^2 + 20^2} = 22.4,$$

and as this error E may have a positive or negative value,

M or the length of the longitudinal dispersion will equal

$$2\sqrt{10^2 + 20^2}.$$

To apply this to the case under consideration the causes leading to error in range will be

- (1) the inherent error in the gun ΔT ;
- (2) the personal error of the number giving, or reading, the elevation given ΔP ;
- (3) The error in taking the range ΔX .

Then

$$M = 2\sqrt{\Delta T^2 + \Delta P^2 + \Delta X^2} \dots\dots\dots (4).$$

ΔT is simply the length of the 50 per cent. length zone.

ΔP can be tested for each individual, or an average can be struck.

ΔX is rather more difficult to evaluate, it is compounded of two errors.

One, the error in measuring the range which we will call dx , and the other the prediction error, or the error in estimating the distance the objective will have advanced or retired during the "time of firing"; dy .

dx will be a percentage of the range and may be written dX where X is the range. This is only true within certain limits; for instance, with the Mark *ID* D.R.F. if the error for short ranges is 1 per cent. or 10 yds. per 1000 at 10000 yds. the error will be much greater than 100 yds.

As above, the whole error

$$\Delta X = \sqrt{dx^2 + dy^2}.$$

The calculation of the error dy is rather lengthy, so I have omitted it and merely give the result,

$$dy = dX \sqrt{2} \frac{T}{t},$$

where T is the time of firing and t the number of seconds between each observation.

i.e. T = time of flight + Fort time.

t = time taken by objective to increase or diminish range by 50 yds. when ranges are called every 50 yards,

$$dy^2 = 2dX^2 \frac{T^2}{t^2},$$

and

$$\therefore \Delta X = dX \sqrt{1 + 2 \frac{T^2}{t^2}} \dots \dots \dots (5).$$

The value $\frac{T^2}{t^2}$ can easily be solved by reference to a F. C.'s correction table.

e.g. if the correction is 50, then $t = T$ and $\frac{T^2}{t^2} = 1$.

If the correction is 25, $t = 2T$ and $\frac{T^2}{t^2} = \frac{1}{4}$.

If it is 100, $t = \frac{1}{2}T$ and $\frac{T^2}{t^2} = 4$.

If 75, $t = \frac{3}{4}T$ and $\frac{T^2}{t^2} = \frac{16}{9}$.

The value dX can be ascertained for any particular instrument and observer at fixed known ranges, and for all except Mark *ID* instrument should not exceed 1 per cent. at medium ranges with well-adjusted D.R.F. and well-trained observers. The values of ΔX can then be tabulated for different ranges and speeds.

ΔP , the error in reading the hydro-clinometer, or other means of reading *QE*, should not exceed $2\frac{1}{2}'$ and can be tabulated in yard values for any particular gun.

ΔT is found in the range tables.

From the above M can be found.

To find N or breadth of zone of dispersion.

By similar reasoning,

$$N = 2 \sqrt{\Delta_1 T^2 + \Delta_1 P^2 + \Delta_1 S^2} \dots \dots \dots (6).$$

$\Delta_1 T$ is the breadth of the 50 per cent. zone.

$\Delta_1 P$ is the lateral error in laying and is usually so small that it may be taken as 1 per cent. of the range.

$\Delta_1 S$, or the error in estimating the lateral movement of the objective, can be calculated in a similar way to ΔX , and is equal to

$$da \times \frac{T_1}{t_1} \sqrt{2},$$

where da is the value of the error in reading the bearing of the objective by means of the arc and vernier and can be estimated at .2 per cent. of the range, T_1 the time of flight¹, and t_1 the time taken by the objective to traverse 1° of arc, and can be tabulated for various speeds if the direction and range are known.

Thus the values of A , B , M and N can be tabulated. $\frac{A}{M}$ and $\frac{B}{N}$ can be worked out and their values compared with a probability table, and the corresponding percentages p and p_1 found; then $\frac{p \times p_1}{100}$ will be the percentage of effective hits.

Before proceeding to work out an example I will remark on the uses of all this rather elaborate calculation.

Stated briefly they are

(1) The interest in knowing what is the factor of efficiency we may expect from any particular gun at objectives moving under various conditions of speed, direction, range, &c.

(2) It might be of value to a Section C.R.A. in helping him to decide which of several objectives should be engaged, or at what range to open fire on any particular objective.

(3) If a coast defence 'Kriegsspiel' was ever organized it would enable the umpires to form an idea of the probable results of any particular period of the engagement.

(4) It would assist one in comparing the results of different batteries firing at practice under different conditions.

I will now proceed to work out the tables of values for A , B , M and N for a particular gun and objective, and then to show how these tables can be used to ascertain the probable percentage of effective hits.

I will take as an example a 6" B.L. gun Mk IV or VI, 100 ft. above sea level for the gun, and a ship 100 yds. long by 20 yds. wide with a freeboard of 5 yds. for the objective.

$$A = \frac{L \times l}{\sqrt{l^2 \cos^2 \phi + L^2 \sin^2 \phi}} + \frac{h}{\tan \theta} \text{ (from (1))},$$

put

$$\sqrt{l^2 \cos^2 \phi + L^2 \sin^2 \phi} = \lambda \dots \dots \dots (7),$$

$$A = \frac{L \times l}{\lambda} + \frac{h}{\tan \theta} \dots \dots \dots (8),$$

$$= \frac{2000}{\lambda} + \frac{5}{\tan \theta}.$$

¹ If laying by Case II.

λ will vary with the value of ϕ or the inclination of L the length of the ship to the line of fire.

θ with this particular gun at this particular height above sea level will vary with the range.

Now when $\phi = 0$ the ship is advancing or retiring directly. The value of A is obviously the length of the ship L + the horizontal equivalent of the angle of arrival θ due to the height h of the freeboard.

But

$$A = \frac{Ll}{\lambda} + \frac{h}{\tan \theta}, \quad \therefore \frac{Ll}{\lambda} = L, \text{ and } \lambda = l.$$

Similarly when $\phi = 90^\circ$; that is, when the ship is moving across at right angles to the line of fire,

$$\lambda = L \text{ and } A = l + \frac{h}{\tan \theta}.$$

But for intermediate values of ϕ , e.g. $15^\circ, 30^\circ, 45^\circ, 60^\circ, 75^\circ$, λ must be calculated by working out the value of the expression

$$\sqrt{l^2 \cos^2 \phi + L^2 \sin^2 \phi}$$

for the different values of ϕ ; these values work out to

	$\phi = 0$	15°	30°	45°	60°	75°	90°
III.	$\lambda = 20$	32.29	52.91	72.11	87.18	96.72	100
	$Ll = 100 \times 20$						

IV.	$\therefore \frac{Ll}{\lambda} = 100$	62	37.8	27.7	22.9	20.6	20
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$\frac{h}{\tan \theta}$ must be worked out for successive ranges 1000, 2000, 3000, 4000, 5000, 6000 yds. θ being equal to the angle of descent + depression angle must be found by working out the depression angle at these ranges due to the height of the gun, and adding the result to the D.A. given in the range tables. h the freeboard = 5 yds.

		Ranges					
	yds.	1000	2000	3000	4000	5000	6000
V.	$\frac{h}{\tan \theta} = 102.2$	94.88	64.73	43.11	30.04	22.04	

Calculation of A .

From IV.

	$\phi = 0$	$\phi = 15^\circ$	$\phi = 30^\circ$	$\phi = 45^\circ$	$\phi = 60^\circ$	$\phi = 75^\circ$	$\phi = 90^\circ$
	$\frac{Ll}{\lambda} = 100$	62	37.8	27.7	22.9	20.6	20

Values of $\frac{h}{\tan \theta}$.

From V.

Ranges	
1000	=102.2
2000	94.88
3000	64.73
4000	43.11
5000	30.04
6000	22.04

TABLE VI.

Values of *A*.

Ranges	$\phi=0$	$\phi=15^\circ$	$\phi=30^\circ$	$\phi=45^\circ$	$\phi=60^\circ$	$\phi=75^\circ$	$\phi=90^\circ$
1000	202.2	164.2	140	129.9	125.1	122.8	122.2
2000	194.9	156.9	132.7	122.6	117.8	115.5	114.9
3000	164.7	126.7	102.5	92.4	87.6	85.3	84.7
4000	148.1	105.1	80.9	70.8	66	63.7	63.1
5000	130	92	67.8	57.7	52.9	50.6	50
6000	122	84	59.8	49.7	44.9	42.6	42

Calculation of *B*.

$$B = \frac{\frac{\pi}{4} L \times l + \frac{h}{\tan \theta} \lambda}{A} = \frac{1571 + \frac{h}{\tan \theta} \lambda}{A} \dots\dots\dots (2).$$

Omitting intermediate steps the result is tabulated.

B (TABLE VII.).

Ranges	$\phi=0$	$\phi=15^\circ$	$\phi=30^\circ$	$\phi=45^\circ$	$\phi=60^\circ$	$\phi=75^\circ$	$\phi=90^\circ$
1000	18	29.5	50	68	83.5	92.5	96.5
2000	18	30	50	68	83	93	96
3000	17	29	49	68	82	91.5	95
4000	17	28	47.5	65.5	80.5	91.5	93.
5000	16.5	27.5	46.5	64.5	79	88.5	91.5
6000	16	27	46	63	77.5	87	90

Calculation of *M*.

$$M = 2 \sqrt{\Delta T^2 + \Delta P^2 + \Delta X^2} \dots\dots\dots (4).$$

$$\Delta X = dX \sqrt{1 + 2 \frac{T^2}{t^2}} \dots\dots\dots (5).$$

dX can be taken as 1 per cent. of the range.
The value of $\frac{T^2}{t^2}$ is obtained as previously explained.

Value of

F. C.'s corr ⁿ .	25 yds.	50 yds.	75 yds.	100 yds.
$\frac{T^2}{t^2}$	= $\frac{1}{4}$	1	$\frac{16}{9}$	4

From (5)

F. C.'s corr ⁿ .	0	25	50	75	100
VIII. ΔX^2	= 0	$\frac{3}{2}dx^2$	$3dx^2$	$\frac{41}{9}dx^2$	$9dx^2$

Since dX is 1 per cent. of the range, we get the following value for dX^2 :

Ranges	1000	2000	3000	4000	5000	6000
IX. dX^2	= 100	400	900	1600	2500	3600

Values of

$$\Delta X^2 = dx^2 \sqrt{1 + 2 \frac{T^2}{t^2}}.$$

From VIII. and IX.

TABLE X.

F. C.'s corr ⁿ .	100	75	50	25	0
Ranges					
1000 yds.	900	455	300	150	0
2000 „	3600	1822	1200	600	0
3000 „	8100	4100	2700	1350	0
4000 „	14400	7288	4800	2400	0
5000 „	22500	11388	7500	3750	0
6000 „	32400	16400	10800	5400	0

ΔT is the length of the 50 per cent. zone and can be found from the Range tables.

ΔP is the value of $2\frac{1}{2}'$ error at various ranges and can also be found.

TABLE XI.

yds.	ΔT	ΔT^2
1000	23	529
2000	18	324
3000	17	289
4000	21	441
5000	29	841
6000	40	1600

TABLE XII.

ΔP	ΔP^2
48	2464
40.5	1640
33.5	1122
27	729
22.5	506
19.5	380

By adding these three values and doubling their square root we get the value of M as shewn in the table.

TABLE XIII.

Values of *M*.

Ranges F. C. corr ⁿ .	1000	2000	3000	4000	5000	6000
100	122	147	194	250	309	371
75	115	121	147	182	226	271
50	112	110	127	155	189	226
25	109	99	104	120	144	172
0	108	95	95	106	125	150

The values of *N* are found in a similar way.

$$N=2\sqrt{\Delta_1T^2+\Delta_1P^2+\Delta_1S^2}\dots\dots\dots(6),$$

where Δ_1T is the width of the 50 per cent. zone.

Δ_1P is estimated at .1 per cent. of range (.001).

$\Delta_1S = d\alpha \times \frac{T_1}{t_1} \sqrt{2}$, $d\alpha = .2$ per cent. of range.

T_1 = time of flight, t_1 time taken to traverse 1° of arc; omitting intermediate steps the result is

TABLE XIV.

Values of *N*.

Ranges F. C.'s corr ⁿ .	1000	2000	3000	4000	5000	6000
2°	11	23	34	46	58	69
1° 45'	10	20	30	40	50	60
1° 30'	9	17	27	35	48	52
1° 15'	7	14	22	29	36	43
1°	6	12	18	24	30	36
45'	4	9	14	19	24	29
30'	3	7	10	14	18	22
15'	2	5	8	10	13	16
0	2	4	6	9	11	14

Example of use: gun and objective as in tables; direction of advance $\phi = 30^\circ$; Range 5000 yds.; F. C.'s correction 75 yds. and 15'.

$A=68. \quad B=46.5. \quad M=226. \quad N=13.$

$\frac{A}{M} = \frac{68}{226} = .3$ referred to probability table = 16 per cent.

$\frac{B}{N} = \frac{46.5}{13} = 3.57$ „ „ = 98 per cent.

$$\begin{array}{r} .98 \\ .16 \\ \hline .588 \\ 98 \\ \hline .1568 \end{array}$$

·1568 = 15·68 per cent., which would give the probable percentage of effective hits.

Except with Position Finders it is difficult to obtain the exact value of ϕ or the angle of approach, but it is easy to draw up beforehand tables giving the probable percentage of hits for objectives at various speeds moving either directly towards or away ($\phi = 0$), directly across $\phi = 90^\circ$, or midway between the two $\phi = 45^\circ$. For this it is necessary to have tables of F. C.'s corrections and a speed table in order to be able to select the proper value for M .

With electric range dials and when firing by Case II. the Fort time may be taken as 2".

The Fire Commander's correction table will then be

TABLE XV.

F. C.'s corr ⁿ . for Range	1000	2000	3000	4000	5000	6000 yds.	
	"	"	"	"	"	"	
0	16	20	28	40	52	64	} time to traverse 50 yds.
25	8	10	14	20	26	32	
50	4	5	7	10	13	16	
75	3	4	5	7	10	12	
100	2	3	4	5	7	8	

TABLE XVI.

for Training	1000	2000	3000	4000	5000	6000 yds.	
	"	"	"	"	"	"	
9	16	24	40	1 4	1 28	2 16	} time to traverse 1° of arc
15'	8	12	20	32	44	1 8	
30'	4	6	10	16	22	34	
45'	3	5	7½	12	17	26	
1°	2	3	5	8	11	17	
1° 15'	1½	2½	4½	7	10	16	}
1° 30'	1½	2½	3½	6	8½	14	
1° 45'	1½	1¾	3¼	5	7½	12	
2°	1	1½	2½	4	5½	8½	

TABLE XVII.

Speeds.

				if $\phi = 0$	if $\phi = 45^\circ$
20 knots is equivalent to 50 yards in				4½"	7"
15	"	"	"	7"	10"
10	"	"	"	9"	13"
5	"	"	"	18"	26"

A ship advancing directly end on at any of the speeds given in this table will increase or diminish the range by 50 yards in the time shewn opposite the speed in and under the column heading $\phi = 0$. A ship advancing obliquely at the same speed will not alter the range by

50 yards so quickly; the times given in the first case must be multiplied by some factor, and when $\phi=45^\circ$ this factor is $\sqrt{2}$ or 1.4. These results have been placed in the second column under $\phi=45^\circ$. When the ship is moving directly across the range is constant and the F. C.'s correction is 0.

Example: a ship advancing direct at 15 knots, Range 5000 yards,

$\phi=0$		
Time 7",	F. C.'s corr.=100,	$M=309$.
$\phi=45^\circ$		
Time 10",	F. C.'s corr.=75,	$M=226$.
$\phi=90^\circ$		
Time ∞ ,	F. C.'s corr.=0,	$M=125$.

Table of Deflections.

Since 1° subtends 50 yards at a range of 3000, at that range a ship moving directly across $\phi=90^\circ$ will traverse 1° of arc in the same time that a ship moving directly end on would take to diminish the range by 50 yards, and if moving obliquely $\phi=45^\circ$ the same factor would hold good, so that the speed table for range would become a speed table for deflection.

At 1000 yards a vessel moving at the same speed would traverse 1° in one-third the time; at 6000 yards in double the time. A speed table for deflection can thus be made.

TABLE XVIII.

Table of times taken to traverse 1° of arc at various speeds.

Speeds	20 knots		15 knots		10 knots		5 knots	
Angles of approach	$\phi=90^\circ$	$\phi=45^\circ$	$\phi=90^\circ$	$\phi=45^\circ$	$\phi=90^\circ$	$\phi=45^\circ$	$\phi=90^\circ$	$\phi=45^\circ$
	Times							
Ranges	"	"	"	"	"	"	"	"
1000	1.5	2	2.25	3.25	3	4.25	6	8.5
2000	3	4.25	4.75	6.5	6	8.5	12	16.75
3000	4.5	6.25	7	10	9	12.5	18	25.25
4000	6	8.5	9.25	13	12	16.75	24	33.5
5000	7.5	10.5	11.75	16.25	15	21	30	42
6000	9	12.5	14	20	18	25.25	36	50.5

Taking the same example,

$\phi=90^\circ$,	time $11\frac{3}{8}$ ",	F. C.'s corr.	1° ,	$N=30$,
$\phi=45^\circ$,	" $16\frac{1}{4}$,	"	$45'$,	$N=24$,
$\phi=0$,		"	0,	$N=11$.

To find A and B in this case, Tables VI. and VII.

$$\begin{array}{lll} \phi = 90^\circ & A = 50, & \phi = 45^\circ & A = 57.5, & \phi = 0^\circ & A = 130, \\ & B = 91.5, & & B = 64.5, & & B = 16.5. \end{array}$$

The percentages can then be found,

$$\begin{array}{lll} \phi = 90^\circ & \phi = 45^\circ & \phi = 0^\circ \\ \frac{A}{M} = \frac{50}{125}, & \frac{A}{M} = \frac{57.5}{226}, & \frac{A}{M} = \frac{130}{309}, \\ \frac{B}{N} = \frac{88.5}{30}, & \frac{B}{N} = \frac{64.5}{24}, & \frac{B}{N} = \frac{16.5}{11}. \end{array}$$

These values can be worked out and referred to a probability table, and the percentage of hits will be found to be

$$\begin{array}{lll} \phi = 90^\circ & \phi = 45^\circ & \phi = 0^\circ \\ 20.5 \text{ per cent.}, & 11.9 \text{ per cent.}, & 16 \text{ per cent.} \end{array}$$

The following is a table of efficiency worked out in this manner.

TABLE XIX.

Table of efficiency or probable percentage of effective shots at a ship $300' \times 60' \times 15'$ from a 6" B. L. gun 100 feet above the sea level, Range instrument D.R.F.

(1) Ship end on advancing or retiring direct, $\phi = 0$.

Ranges	1000	2000	3000	4000	5000	6000
Speeds	Percentages					
knots	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
5	79	83	67.5	46.5	24.25	16.25
10	79	82	59	38.5	21	9.75
15	79	77	59	32.75	16	9.75
20	78	77	52.25	24.75	12	7.5

(2) Advancing or retiring obliquely, $\phi = 45^\circ$.

knots	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
5	58	61	49	35	20.5	13
10	58	59	42.75	30	15.5	8.6
15	57	57	37	23.5	11.9	7
20	54	55	37	19.5	9.7	6

(3) Moving directly across, $\phi = 90^\circ$.

knots	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
5	55	59	45	31	21	15
10	55	59	45	31	20.75	13.5
15	55	59	45	30	20.5	11
20	55	59	45	30	20	9.3

It will be observed that for the 6" gun, Marks IV. and VI., charge 48 lbs., E.X.E. MV 1960 f.s., the probable rectangle as given in the handbook for 1891 is nearly as large at 100 yards as at 5000, and the 50 per cent. length zone is larger, viz. 30 yards at 100 and 29 yards at 5000; in other words, the gun according to this range table is more accurate at 5000 yards than at 100—its accuracy would appear to increase from 100 up to 3200 yards and then to decrease. This accounts for the apparently paradoxical result that you would get a greater percentage of hits at 2000 than at 1000 yards.

At 3000 yards the 50 per cent. zone is still less than at 2000, i.e. the gun is more accurate, but at this range the horizontal equivalent value of the target presented by the objective is considerably less, consequently the percentages begin to fall off.

A PLEA FOR HEAVY GUNS IN FORTRESS DEFENCE.

BY

CAPTAIN G. TYACKE, R.A.

IN the September number of the "Proceedings," Major Hickman, in a very able and interesting article on the "Attack of a Modern Land Fortress," disclaims at the outset any intention of approaching the subject in a dogmatic spirit. It is with the same disclaimer that I would preface the following remarks, which bear on one question in his article, viz.—

"Why not eliminate heavy guns in permanent emplacements altogether from the defence?"

To anyone approaching a subject like this pros and cons suggest themselves with equal readiness. Let us imagine a discussion between, say *H.* and *T.*—

T.—You say that guns in forts, unprotected with armour, must be quickly disabled and that they are in no case able to obtain the same amount of cover as howitzers. Would not guns on disappearing carriages with top shields be even more under cover, except at the moment of firing, than howitzers?

H.—Your shield could be penetrated by high-angle fire, and the gun would betray its position the first time it rose to fire, and once that was noted its disablement by vertical fire would be easy.

T.—At Lydd in 1887, 30 rounds from an 8-inch M.L. howitzer were fired at a 6-inch H.P. emplacement with all the advantages of communication with the range party. The howitzer is said to have shot well, but only one hit was obtained on the shield and that glanced off harmlessly.

You lay some stress on high explosive shells, but it has been shewn that when armour is struck, unless the shell penetrates, the effect of detonation on the armour is almost nil.

When using vertical fire the velocity of the falling projectile is low, and the shell is not usually adapted to armour piercing, so that it would appear only necessary to slightly increase the strength of the over-head shield to make it impervious to high-angle fire. Shields of the present thickness "Harveyed" might be sufficient.

The opening through which the gun rises could be automatically closed if desired as the gun descends.

A 9-inch shell will not penetrate a 4½-in. steel plate with the velocity due to falling from a height of about 7000 feet, and this is probably a more severe trial that is to be expected from any siege piece.

H.—Well, supposing that your gun has the good luck not to be disabled, what can it do that a howitzer could not do as well?

T.—It will secure me the advantages to be got from high velocity, long range and a powerful shrapnel shell.

The permanent nature of their mounting should enable the heavy guns to take part in the fight up to the extremity of their range, and to support the light artillery in the skirmishes before investment is completed, and also in any sorties or counter-attacks made by the defence.

Central pivot mountings lend themselves readily to a system of land position-finding, since they have an all-round arc of fire, and the gun can be laid from under cover.

A position-finding system, originally tried for coast batteries, making use of maps ruled in numbered squares, could be modified to suit land fronts. No cross bearings would be needed, as the features of the landscape would guide the observers, who might be pushed forward to advanced positions in the early stages of the attack, and stationed in balloons later on.

The numbers of the squares, with the range and bearing of each, would be posted up near the gun and fire could be directed on any square specified by the observation parties. Specially important points, such as cross-roads, lines of approach, or probable positions for batteries, etc., would be more minutely sub-divided than others.

Very useful observations were made at Lydd in 1887 from captive balloons, and photographs of the camp were automatically taken from a free balloon with no one in it. It appears likely that free balloons will become more manageable in the future, and there are reasons why it would be far more difficult to hit them than captive ones.

One advantage in high velocity is in the arrival of the shell before warning has been given by the report of the piece. It was found at Plevna¹ that, for this reason, high velocity guns were more dangerous and demoralizing to working parties than pieces whose projectiles travelled slower than sound.

With regard to howitzers and high explosives I have seen the results of firing with delay fuzes at casemates, and very destructive they are, but the shells that missed and buried themselves in the ground before bursting were quite wasted. I have also seen a 6-inch lyddite shell act wonderfully as a man-killing projectile—over a restricted area—when it burst absolutely on the surface, without penetrating the earth. But even if the burst were not smothered, the upward direction of most of the fragments militates against their usefulness, and it will be granted that time shrapnel from high velocity guns has a more wide spread man-killing effect than any percussion shell.

I have endeavoured to show that heavy guns, properly mounted, can still play an important part in the defence, both in the earlier and later stages, and it should be remembered that the defence could always employ more of these weapons than the attack, owing to difficulties of transport, and by suppressing them would relinquish a manifest advantage.

¹ "Report on War Material of the Turkish Army, 1878," by Colonel Maitland, R.A.

NOTES ON GERMAN MANŒUVRES.

BY

MAJOR J. F. MANIFOLD, R.A.

THE manœuvres of the German Guard Corps were held this year over that triangular piece of country to the east of Berlin, of which Berlin, Frankfurt on the Oder and Cüstrin are the corners, the main centres of operations being Munchenberg, a small station on the line running from Berlin to Custrin, and Frankfurt. The country is of considerable historic interest, as it was the scene of the most important events of Frederick the Great's campaign of 1758 and 1759, while the battle of Kunersdorf was fought within a few miles of the city of Frankfurt. The battle-field was an important point in this year's manœuvres, its artillery positions, which have been so graphically described in the Royal Artillery Institution "Proceedings" by Major May, are typical of ground which could be held by artillery in the face of the strongest attacks of infantry. Long rolling slopes of arable land, well cleared of timber, which could be swept equally well by sharpnel of the present day, or by volleys of canister at the shorter ranges of Frederick's time.

The grand parade, which is always attended by the Emperor, was held this year on the opening instead of the final day of the manœuvres. The display was a fine one and was particularly interesting to gunners, as the German artillery then made their first attempt at Galloping-Past. The Emperor had been so much impressed by the gallop past of the Horse Artillery on the occasion of his recent visit to Aldershot, that he ordered that this parade movement should be copied by both the German Horse and Field Artillery. A certain amount of quiet protest was made by the officers at their being suddenly called on to perform, before very critical spectators, a movement which they had not previously practised, for even the crowd which attends German manœuvres is thoroughly professional; the display, considering the lack of practice, was very fair, though the somewhat ragged line in which a few of the batteries went past might have been the cause of unpleasantness had the same been seen at Aldershot. The difference in the pace of movement of the German horse and field artillery is not so marked as with us, it has always been the custom for the latter to move at a gallop when necessary and they have thus become accustomed, through length of years, to the more rapid pace of

manœuvre. It is still considered by some that for field artillery to gallop is passing beyond their province, and it is not long since that I heard an officer commanding a very smart field battery in India called to account by a General officer, for bringing his guns into action at a gallop, although at a critical stage of the fight.

The manœuvres opened with a very severe day for the cavalry, the whole of the eight cavalry regiments of the Guard Corps marching in one day from their quarters in Berlin and the neighbourhood to their billets in the villages around Frankfurt, a distance of over fifty miles. It was a heavy day and the horses looked a good deal tuckered up after it, but the Veterinary Surgeon of one of the Ulan regiments assured me that there had been very few cases of sore backs or of horses rendered unfit for work from other causes. The horses of both artillery and cavalry in the German army always appear very fine drawn, but they are a tough lot of animals though light and lanky in comparison with English troop horses, but the hard condition in which they are always to be seen, allows of their going through very severe work without injury. The horses are, for the most part, obtained from the eastern provinces of Prussia, where they are bought when three or four years old, by the remount committees, from the large land owners. They are then sent to the remount depôts and remain there for a year or more, till they are sent to the various regiments as circumstances require.

A great deal of trouble and time is expended in training the remounts, most of them remaining in the school for a year at least, before they finally take their place in the ranks. A cavalry soldier, like the remainder of the army, now serves for two years only, during which time he has to learn everything connected with his work, it is impossible to make him a really good rider in that time, but by giving him a thoroughly broken horse matters are very much simplified, with the result that, although the German cavalry may not be good horsemen individually, yet when taken as a body they are able, thanks to the perfect training and steadiness of their horses, to manœuvre and drill with the greatest precision. No horses take part in the annual manœuvres till they are six years old, so none but seasoned animals are in the ranks, and much of that prematurely developed unsoundness, demanding casting at an early age, is avoided. This causes the squadrons to be somewhat weaker than they would otherwise be, but the horses, though not actually in the ranks are always ready to accompany the regiment should mobilization on a war footing be required. The system provides good horses and is economical in the long run. It is only in the Saxon army that the mounted services are not supplied from the depôts, but it has always been the custom in Saxony to buy direct from the dealers, despatching the horses at once to the various regiments, the remounts thus purchased being consequently a year older than those obtained for the depôts. The Saxon officers do not uphold their system, but it is hard to change from long established ways.

Bicycles are now being used to a very considerable extent for all kinds of orderly work, which can be done over roads. Two or three bicyclists are attached to each brigade; on the march they move at

the head of the column near the General Officer Commanding, ready to convey orders to corps marching in rear. Even if the roads are somewhat blocked a bicyclist requires but very little lateral space, and under such circumstances he can make more rapid progress than a horseman. The marching discipline of the German army is very good, when halted, even for a few minutes, troops immediately take up a position on one side of the road, leaving the centre of the road clear.

Nothing could be better than the German horse blanket, it is made of a warm fleecy material and is very much larger and heavier than the saddle blanket in use in our service, it completely takes the place of our numnah, being folded in three for this purpose, the thick, soft material, from which the blanket is made, affording good protection to the back. The blanket when opened for use as a covering is about seven feet long by six feet broad, and covers the horse from head to tail, the breadth allowing of the belly and legs to be well protected; the saddle surcingle is used for keeping the blanket on the horse, the front corners of the blanket being knotted together across the chest. The ration given to the horses of artillery and cavalry differs very materially from what we allow—two pounds more of grain, and about one-half the quantity of hay, being given. In barracks the allowance of straw is seven pounds daily, but the climate of Germany is so dry and the seasons so regular, that bedding can be disposed of much more economically than in England. Most of the officers to whom I was speaking were of opinion that the ration of hay was not sufficient. During manœuvres every horse gets in reality much more than the above allowance; bedding is always supplied to an unlimited extent by the farmer on whom the horses are billeted, and a very considerable increase is generally made to the Government allowance of hay through the same source, so that one cannot judge fairly at manœuvres of the condition of the horses as fed solely on the Government ration, as the latter is so largely subsidized from the farmers' stack yard; this gift of forage is not always made without a considerable grumble. The amount of kit carried on the horse is much smaller than in England, as no spare clothing is taken by the men, the only cloth clothes allowed being the one suit which is actually in wear, while the only change of clothing allowed is a loose jacket and trousers of stout canvas. These make an excellent change after a march; in summer, directly the men come in, the cloth clothes are exchanged for the canvas suits, while in cold weather the canvas is worn over the cloth thus giving a great deal of extra warmth. This white dress always looks neat and clean, and is well suited for all work about stables and such like duties.

A certain amount of change has been introduced of late in the equipment of the German soldier. It is now intended that in the actual engagements of importance that the knapsack should be left behind. The total weight carried by the infantryman is just under sixty pounds, an immense load for a man to march and fight under, so on the day of battle the knapsack will be left behind, and a few articles of absolute necessity will be carried in a small canvas bag, known as the "sturmbutel." This bag much resembles an ordinary cartridge bag, it weighs a few ounces, and when not in use it is carried at the

back of the knapsack under the flap ; it is intended to hold a few small articles of clothing and the compressed ration with which the German soldier never parts. When in use, the bag will be carried on the back, attached to the person by the ordinary knapsack straps. The mobility of the infantry when relieved of their heavy packs should be considerably increased ; till now the German infantry have never been free from the weight of their knapsacks, and all the fighting during the war of 1870 was done by men carrying more than half-a-hundredweight ; relieved of a portion of this crushing weight, fighting power will be proportionately improved. Some very thorough system must be worked out which will enable a man to recover his knapsack on the conclusion of a fight ; even in the case of a victory this would be no easy matter, while should a reverse take place, it would be an impossibility. Warning might well be taken from the facts recounted in a recent article in the *Fortnightly Review*, which tells how some of the regiments, which landed in the Crimea without their kits, did not recover them till six months later, a most severe winter having meanwhile been spent without them.

Besides his kit, the infantryman now carries a share of a tent, the smallest number of portions which can be put together is four, but twenty pieces, or more, joined together afford the most economical arrangement of shelter. The tents are made from a light kind of waterproof material, dyed khaki colour ; each portion is about $5\frac{1}{2}$ ft. long by $4\frac{1}{2}$ wide, and is carried folded round the knapsack outside the great-coat. Each man carries a light tent pole made in three parts, which, when required for use, are fitted together with a socket joint ; each stick is about 18 inches long, and the three are carried at the back of the knapsack under the straps, the waterproof tent and jointed pole weighing about six pounds all told. To put the tent together the various pieces of canvas are layed side by side on the ground, and buttoned together, the edges being arranged so as to overlap about six inches and so prevent the rain working through. The buttons are made of aluminium for the sake of lightness, a very important matter where every possible ounce of weight must be saved. The buttons are well sewn on, as the difficulty of reattaching them to the canvas would be considerable. The canvas portion of the tent forms at other times a most practical waterproof cape, buttoning across the man's chest and held round the waist by the small piece of tent rope, which each man carries. In wet weather sentries and men on out-post duty always wear these canvas coverings, and they all speak most highly of the protection which they afford. Under the old system of bivouacking, tents were not provided. A screen of canvas or straw, about $3\frac{1}{2}$ ft. high, was erected in a circle, whose area was sufficient to give lying down space to about sixty men, the camp fire was built up in the centre, and the men slept shoulder to shoulder with their feet towards the fire. This was an excellent plan in dry weather, the screen was a perfect shelter from the wind and the men kept each other warm, there was, however, no head cover against rain, so the screen was abandoned for the present system of tents. The tents are good, and the men say that they find them very comfortable, but the comfort is at times hardly earned under the extra

load of six pounds. The artillery and cavalry do not carry tents of any kind, when bivouacking the men sleep between the two rows in which the horses of a sub-division are picketted, and in this way get a certain amount of protection from the wind. At manœuvres a plentiful supply of straw is always issued, and the gunners say that they sleep comfortably in the open.

The German boot differs very much from ours, it is a low Wellington, the advantage of which is that the mud cannot work in by the ankle, so neither gaiters or spats are required; the boot would be according to our ideas unsuitable for marching, but it is the pattern most commonly worn by all the working classes throughout Germany, so that the men have always been used to it and would not readily understand the mysteries of a lace-up boot, and certainly the marching power of the infantry is beyond question. The long boots of the mounted troops are but seldom made with much attempt at cut or smartness, the boot fits loosely round the calf, with the advantage that whatever may be the weather, it can be pulled on or off without trouble.

No part of the uniform is smarter or more genuinely useful than the great-coat. The collar is the great feature, when not in use it lies well back over the shoulders being cut so deep as to almost form a cape, but when turned up, at night time or in bad weather, it comes well over the ears and nose, while a small pocket of alpaca, a continuation of the collar lining, forms a hood or cap, fitting tight on the head, so as to allow of the forage cap being worn outside. The durability of the material is beyond question. One evening I was talking to some men of the 1st Guard Ulans, who after a long day were cleaning their kit and packing it away for the following morning's parade, four of the men were engaged rolling a cloak, and noticing its very aged appearance, I said "that cloak has given the state good service," "yes," replied the owner "I think it is about time it was cast, it has been twenty-five years in the regiment;" the other men laughed but the man undid his cloak and shewed the date of issue 1868, saying "it was serving in this regiment five years before any of you were born." This incident is a true example of the strict economy and care with which everything is seen to in the German army.

The conditions under which manœuvres are held in England and in Germany are so different, that it is hard to draw a fair comparison between the two. With us manœuvres may be said to be carried out only on sufferance, and their present development is largely due to the personal influence of a few of the senior officers of the army, who have, in their private capacity, obtained permission for troops to manœuvre over a certain extent of country. In Germany the whole country is open to the army without let or hindrance, and a General Officer is in no way hampered by having his manœuvre maps marked in all kinds of colours to distinguish the ground over which his men may move, from that over which it is strictly forbidden to cross. - The actual manœuvring of the troops is therefore bound to partake more of the real nature of war than with us, but it is more especially in the manner in which the men are housed and fed, that the great difference occurs.

During the manœuvres every regiment must pass two or three nights

in bivouac for the sake of training in camp work, and the last two days of the manœuvres are generally devoted to movements where the whole force bivouacs in the open, but with these exceptions the troops are, as far as possible, billeted in the various villages in the neighbourhood of which the manœuvres are being held. This system of billeting causes a good deal of trouble and inconvenience to the country people, and puts them to a certain amount of expense. All arrangements for billeting are made between the staff officer of the troops and the "Schulze" or government tax gatherer of the villages, who receives a notice to the effect that a certain number of troops, say one battery of artillery, one company of infantry and half a squadron of cavalry will be quartered in one of the villages in his charge for one or two days, and it is his business to distribute the men and horses among the farm-houses in fair proportions. As a rule, the officers are lodged together, and a fair sized farm may have to find accommodation for about twenty-four men and from twelve to twenty horses, but these numbers will vary with the number of men billeted on the village. The men arrive at their billets during the afternoon, and as the commissariat will have distributed their rations during the forenoon, they expect to find their dinners ready. A householder is not legally bound to cook the soldiers' rations, but it is the unwritten law of the land that this should be done, and to allow of weary men to cook their own food, would be an act of inhospitality which would be far from the mind of any German. To cook for twenty men is no light matter, as out of this number there are probably two "avantageurs" or candidates for commissions, who must of course have their food apart from the others, there will also be the "einjahrige" or one year's men, who, coming from a higher social class than the common soldiers, expect a separate mess; three different sets of meals will therefore have to be prepared. The rations are both in quality and quantity inferior to ours, and the men expect the householders, on whom they are billeted, to supplement them considerably from their own larders. The soldiers generally expect to have their ration bread exchanged for the home-made bread of the farmer. The quality of the flour from which the ration bread is made is good, but the bread is often badly baked and sodden. Should a bye-day from manœuvre work occur, three meals, breakfast at seven o'clock, dinner at noon, and supper will have to be prepared, so that the farm establishment will spend most of its day in cooking for the soldiers quartered on them.

The "avantageurs" and "einjahrige" are, when possible, put into rooms or out-buildings, apart from the other men. Most farm-houses seem to possess an infinite number of mattresses, these are filled with straw and make excellent beds, while all the spare blankets, quilts, and every kind of covering, are called into requisition, without which the men would often pass an uncomfortable night. Officers are provided with accommodation in the owner's house, though two or three may at times have to share the same room; the men are put into the barns and out-houses, where, with the help of spare mattresses borrowed from the house, and unlimited straw, they make themselves very comfortable. At the recent Guard manœuvres a barn was set on fire by some of the

men smoking after they had gone to bed. The dry straw caught fire and burnt like tinder, and three men of the Third Infantry of the Guard were burnt to death and much property was destroyed.

Except for transport of men's rations, Government carriage is but little used, all carts required for baggage and the various stores, being obtained on requisition from the farmers, or in the town from those persons who keep carts. Twenty-four hours notice is generally given to a farmer that he will be required to supply one or more carts, and should he fail to comply with the order he subjects himself to severe punishment. Officers are allowed but little baggage, a small trunk or valise is all that is taken; with a marching order under these light conditions, one country cart drawn by three horses will generally suffice for the officers' baggage of a battalion. The mess kit is always of the lightest description, as, except in bivouacs, everything will be supplied by the owner of the house on whom the officers are billeted. When in bivouacs a large number of carts are required, as all straw for the men's bedding, firewood, etc., must then move with the troops. The system under which the military train arrangements are managed is most thorough, every petty detail being worked out with a surprising degree of accuracy. The impressed carts assemble at an early hour at the named place, and are formed up in lines, classified according to the number of horses by which they are drawn. The wagons are then told off as required to the various regiments and brigade-divisions of artillery, one man being detailed to accompany each cart belonging to his corps or regiment. The carts for officers' baggage proceed at once to the houses in which the officers have been quartered, while the remainder are led to the wood or straw stores, according to whatever load they may be required to carry. As soon as the carts are loaded they are formed up on the road, the carts being kept together according to their regiments; a division of fifteen thousand men will require a very large number of carts, so the length of the column is a most serious matter.

The carts and wagons follow the direction taken by the troops, and when some appointed place is reached they halt until orders arrive as to the place where the troops will bivouac. This information cannot come to them from the front till the whole operations of the day are over and it has been decided where the troops shall pass the night. The wagons are at once led forward and as they approach the neighbourhood where the division will bivouac, they are met by orderlies, who conduct them to the various camping grounds, selected for the various corps and regiments. This is undoubtedly carrying out transport arrangements as closely as possible to the conditions of actual war, for when troops move off in the morning, it is absolutely undecided where they will bivouac that evening. The whole system of transport is excellent, and there is a complete absence of hurry or disorder of any kind. The orderly manner in which the carts are driven into their proper positions and controlled on the line of march, could only be effected in a country where every wagoner, though wearing corduroy clothes and a peasant's cap, is as well disciplined as the men in the ranks wearing the Imperial uniform.

A detailed account of the scheme of each day's manœuvring would not be interesting, unless described by some one thoroughly posted in all the arrangements connected with the work of the manœuvres, but I will venture to give a short account of the final day but one, as from a gunner's point of view, the episodes were then decidedly instructive. On the previous night the head-quarters of the First Division of the Corps of Guards was at Frankfurt, with the object of attacking the Second Division of the same corps, who were believed to be about twenty miles to the north, in the neighbourhood of Müncheberg, a station on the line of railway from Berlin to Cüstrin. The First Division moved off at seven o'clock, two cavalry regiments, the Gardes du Corps and Garde Cürassiere covering the right front. After hard marching for three hours news was sent in by the cavalry that they had found the enemy towards the right, and the six batteries of the division were at once ordered to the front. The batteries moved forward at a trot for about three miles, when they were halted on a bye-road under the cover of a long low hill. In this position the batteries made their final preparations for action, while the General and the staff officers of artillery were selecting suitable sites on which the batteries might come into action, should the enemy appear in force from the expected direction. The ground to the front was of an undulating nature, but clear of woods, and as the General and his staff examined the ground to their front and right, they were far from expecting an attack of cavalry from the left. Suddenly there was a hurried movement among the staff, and orderlies galloped in all haste towards the batteries which were on the road, but before the orderlies could reach the batteries, the General and his staff were seen also to leave their position and hurry towards the rear. Directly afterwards, almost before the six batteries could come into action, fifteen squadrons of cavalry appeared over the ridge which the General had just vacated, and in another moment were charging towards the batteries which were now in action about seven hundred yards distant from the top of the ridge. The guns were rapidly served, but one minute was all the time that was required for the cavalry to cross the intervening space, and even with case shot the number of rounds fired before the cavalry reached the line of guns was comparatively few, certainly not sufficient to have checked an attack of fifteen squadrons numbering about two thousand sabres. A more perfect example of how the entire artillery of a division may be surprised and captured was impossible, and it showed the necessity of artillery being always prepared for an attack of cavalry, even when least expected, and of shrapnel being carried with fuzes fixed and set at a short division.

The umpires at once decided that, considering the short space which the cavalry had to cross, the six batteries must have been captured, and they were accordingly put out of action. The interest in the movement was yet far from ended, for while the gunners were standing by looking dejected at the umpire's decision, and the victorious cavalry were slowly reforming their somewhat shattered ranks, suddenly two more regiments of cavalry, the Gardes du Corps and the Garde Cürassiere, who had been covering the right front, appeared on the scene. The

victorious cavalry attempted to form up and face their new enemy, but in their disorganised state they had hardly time to do so, and the ten fresh squadrons charging them on the flank, it was decided that they were out of action. Thus within the space of five minutes, on the one side six batteries, and on the other fifteen squadrons, were declared to have been rendered incapable of further action; work of a sufficiently exciting nature to satisfy spectators, no matter how greedy for excitement. The cavalry of both sides were somewhat censured, the two regiments of the Gardes du Corps and Garde Cürassiere for having failed to observe the enemy's cavalry and thus exposed the artillery of their division to attack, while the fifteen squadrons were blamed for having ventured to charge without holding a sufficient force in reserve, with which to meet the counter-attack of the enemy's cavalry. The whole day was equally instructive for artillery or cavalry. The troops bivouacked that night in the neighbourhood of the ground over which they had been manœuvring and the following day brought a fortnights manœuvres to an end, the infantry returning to their respective garrisons by train, the mounted troops moving by road.

December, 1894.

DIARY
OF
LIEUTENANT W. SWABEY, R.H.A., IN THE
PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 53, No. 1, Vol. XXII.).

CHAPTER II.

*March to join the Army. Attached to the 7th Division. French
Movements to Victual Ciudad Rodrigo. Actions of El Boden
and Aldea de Ponte.*

12th September.—We marched at day-break from Sacavem, and I went on to Villa Franca to procure billets, &c. for the troop.¹ The road lay over a country bearing the utmost marks of the hostility of its merciless invaders; the villages of Povia, Alverca, and Alhandra deserted and ruined, houses without windows, doors, or roofs, and the few wretched inhabitants worn out with hunger and want. The country was interesting to a military eye, on the left the field-works, which had been in use before Junot arrived at Lisbon; at Alhandra, the formidable lines stretching across the country to Mafra, not as yet quite completed, and with the very many excellent positions in their front, are, I hope, impregnable. Many thousands were employed in completing these works under their own engineers, the positions are by nature very much in their favour, and art has had but little share in strengthening them A bridge is passed here by which Masséna² retreated from Lisbon, and which he in vain attempted to destroy.

There were no works in existence to cover Lisbon when Junot occupied it in 1807. "In 1799, accurate plans of the mountain-

FUENTE GUINALDO,
August 27th, 1811.

¹ Memo. for Lieut.-Colonel Framingham, Commanding R.A.:—

"Captain Macdonald's troop of Horse Artillery to be ordered to be prepared to march as soon as possible, and, when ready, they are to join this army. WELLINGTON."

² Prince of Essling and Duke of Rivoli.

ous country filling the tongue of land upon which Lisbon is situated had been made under the direction of Sir Charles Stuart, and these, together with the French Colonel Vincent's minutes, showing how to cover Lisbon, were in Lord Wellington's possession, and from these documents the original notion of the celebrated lines of Torres Vedras, made in 1810, are said to have been derived. The lines, by means of entrenchments, inundations, and redoubts secured more than five hundred square miles of mountainous country lying between the Tagus and the ocean, and consisted of three lines of defence, the plans and works upon which were executed and carried out by British officers alone:—

The first, extending from Alhandra on the Tagus to the mouth of the Zizandre on the sea coast, was, following the inflexions of the hills, twenty-nine miles long.

The second, traced at a distance varying from six to ten miles in rear of the first, stretched from Quintella on the Tagus to the mouth of the St. Lorenza, being twenty-four miles in length.

The third, intended to cover a forced embarkation, extended from Passo d'Arcos on the Tagus to the Tower of Junquera on the coast. Here an outer line, constructed on an opening of three thousand yards, enclosed an entrenched camp designed to cover the embarkation with fewer troops, should the operation be delayed by bad weather; and within this second camp, Fort St. Julian (whose high ramparts and deep ditches defied an escalade), was armed and strengthened to enable a rear-guard to protect both itself and the army. Of these stupendous lines, the second, whether regarded for its strength or importance, was undoubtedly the principal, and the others only appendages, the one as a final place of refuge, the other as an advanced work to stem the first violence of the enemy, and to enable the army to take up its ground on the second line without hurry or pressure." "Memoranda of the Lines, &c.," by Colonel J. T. Jones, R.E. Napier, Vol. 3, p. 255, *et seq.*, and 351.

On arriving at Villa Franca, the scene between me and the Juiz de Fora¹ must have been good, neither of us understanding a word the other said. I, however, contrived to get the billets, &c. There was much difficulty among the servants to-day, in consequence of their being unused to packing mules, and they were so late in, that we feared we should begin our march on an empty stomach, so their appearance at 5 o'clock was extremely gratifying. As to our quarters, fleas and bugs were the principal inhabitants, and so tormenting was their company that we did not regret a little fatigue, which supplied at last the place of an opiate. Macdonald, Maxwell, Taylor, and I were in one room, and that not particularly large, and never were four gents so tormented! Men and horses, as usual, occupied the same domain.

13th September.—We marched at 5 o'clock, the country not at all

¹ Juiz de Fora, a Justice of the Peace, equivalent to our billet-master or constable.—*F.A.W.*

improving as we advanced, little cultivation, sickly inhabitants, and bad roads; "Viva Senhor" indeed saluted us often enough, but this was all that was even to be purchased. The modern system of cookery, which implies men cooks and provides second courses at dinner, we here find defied by *soupe* and *bouilli* at top and *soupe* and *bouilli* at bottom. We were provident enough, however, to supply ourselves beforehand with materials for plum-pudding, and our cook contrived, with the aid of our imaginations, to represent one. Sutton and Captain M.'s servant, still commending the tractable temper of the mules, were to-day left behind. I was much alarmed at their non-appearance, as the night before we left Sacavem, a servant of an officer of the Guards, on his way from Lisbon, had been brought in terribly wounded by some villains in the dark. Sutton, however, made his appearance at about 9 o'clock, he had been left on the road, the mules being entirely knocked up; he had then loaded my gun and waited till they freshened, and thus, by his perseverance, brought in the baggage. His companion, who had gone to seek assistance, lost his way and was still missing.

14th September.—Marched this day at 5 o'clock through a country getting every step more wild and romantic. Even where there were houses, the inhabitants had left them, as well as the windows! Notwithstanding the devastations of the French, the indolence of the people was sufficiently apparent in the want of cultivation, the unevenness of the roads, and the immense stones that lie in them. The dust and heat were very trying, and the sick list, principally cases of dysentery, begins to lengthen. We meet detachments of sick every day on their way to Lisbon.

The village of Cartaxo through which we passed, is in the most ruined state I have yet seen, on every wall is marked "*Logement de 4 comp^e*," or some billet of the French army.

A mile short of Santarem are the famous positions where Lord Wellington and Masséna stood so long at bay. They are on two opposite hills, almost within musket shot of each other: we passed over the bridge that communicates between them across a deep ravine, where on either side batteries are erected within point blank range. These positions are flanked by the Tagus, and on the left of Lord Wellington's, the mountains rendered an attack from the enemy hopeless.

After the battle of Busaco on the 27th September, 1810, Wellington retired within the lines of Torres Vedras, Masséna followed and took up a permanent position in front of Alhandra. The war was thus reduced to a species of blockade; Masséna's object being to feed his army until reinforcements reached it; Lord Wellington to starve the French before succour could arrive. In October, Masséna being convinced it was impracticable to force the lines without great reinforcements, fell back to the position at Santarem, Wellington followed, and his headquarters were fixed at the village of Cartaxo. In these positions the hostile armies remained from the 18th November, 1810, to

the 14th March, 1811, when the French were forced to retreat, the English army advanced, and the campaign of 1811 ensued. See Napier, Vol. 3, pp. 362-377.

Santarem is, for its size, a fine city, preferable to Lisbon, it is full of convents and churches, from whence the fair inhabitants, as well as the plate and ornaments have been stolen, and every step presents a ruin. We were fortunate in our quarters, occupying a large episcopal house which had been Masséna's head-quarters. I bathed in the Tagus towards evening.

The Duke of Leinster, Lord E. Fitzgerald, and Lord Delewarr partook of *soupe* and *bouilli* with us, and were glad enough to do so. . . .

15th September.—I was employed the whole of this day in arranging the issue of provisions, which had been very irregularly conducted. Bathed in the Tagus and commenced a letter to my father. . . .

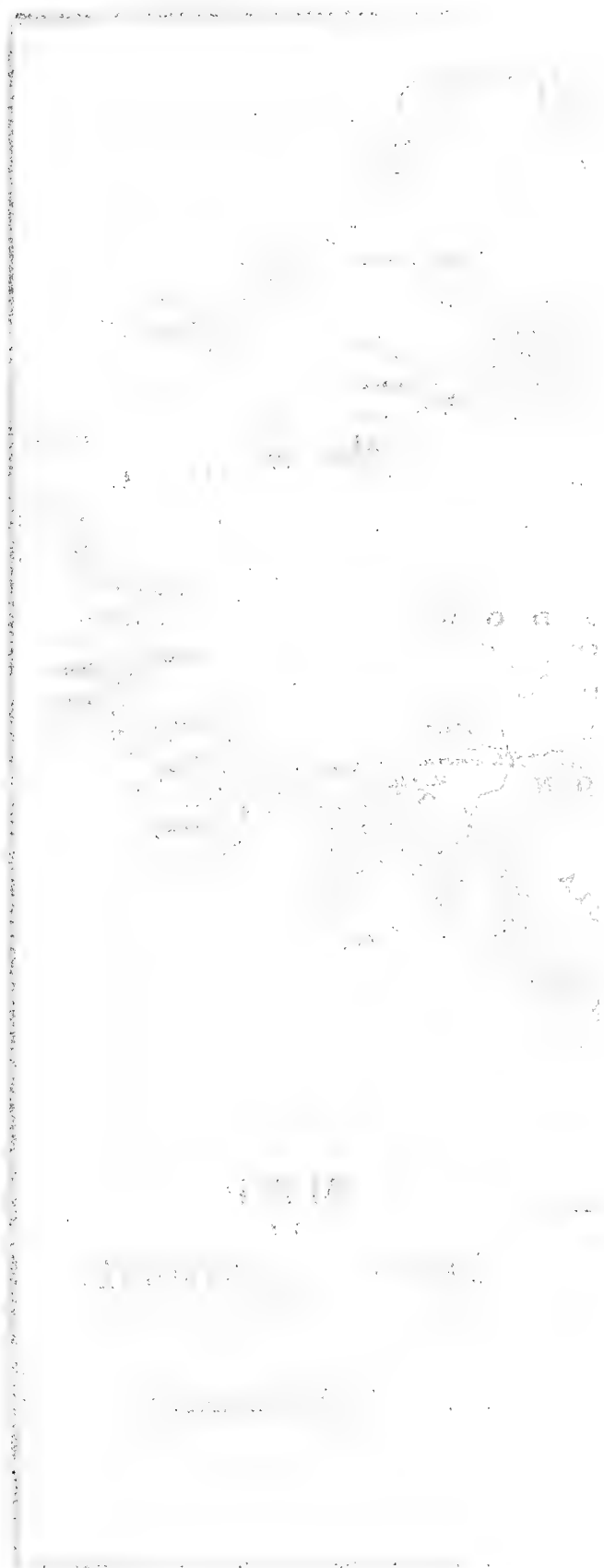
16th September.—Having more time to look about me, visited the positions where the sentries, or rather stumps of trees doing duty as sentries, still threaten the opposite brush-wood. I shot with Taylor and killed four quails, which bird abounds here, but the heat by Fahrenheit's thermometer being 97°, we could not make much of a walk of it. Harding was attacked very sharply with dysentery, and the sick list increased. I did not mention in its proper place that Dyneley was left at Lisbon for the benefit of his health, and that some of our men, on the night of the 9th, being in the act of stealing grapes, were attacked in a vineyard at Sacavem, they drew their swords, and two of them, Goff and Phillips, were slightly wounded, Lowrey and Bugden severely so, the latter died whilst being carried to Lisbon. . . .

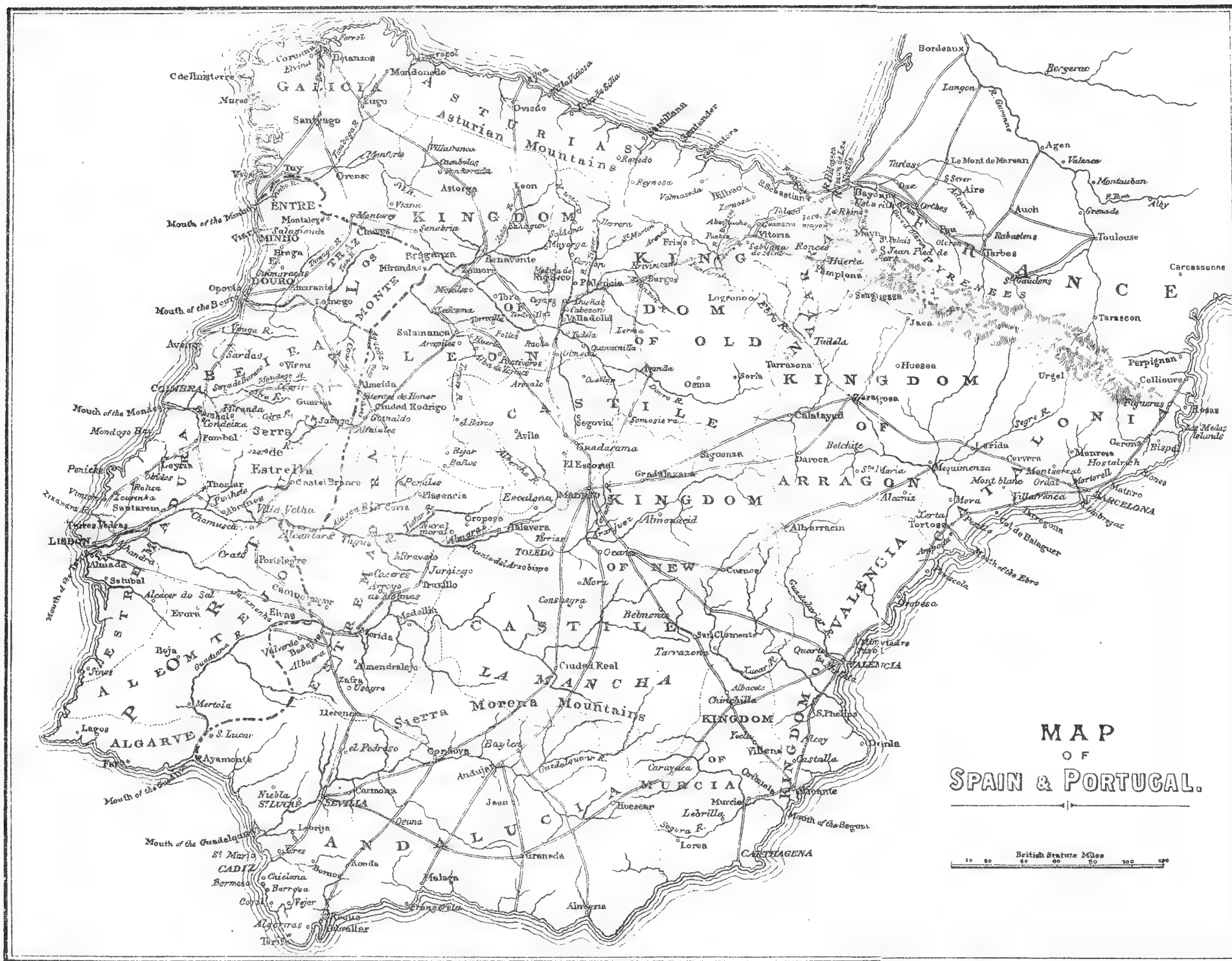
17th September.—Marched at 4 o'clock, before daylight, over a flat country filled with quails, and principally producing hemp, which is spun by the women in every village: this is performed without a wheel, being twined round a stick, as thread or cotton is; this they do through habit so quickly that a wheel is unnecessary.

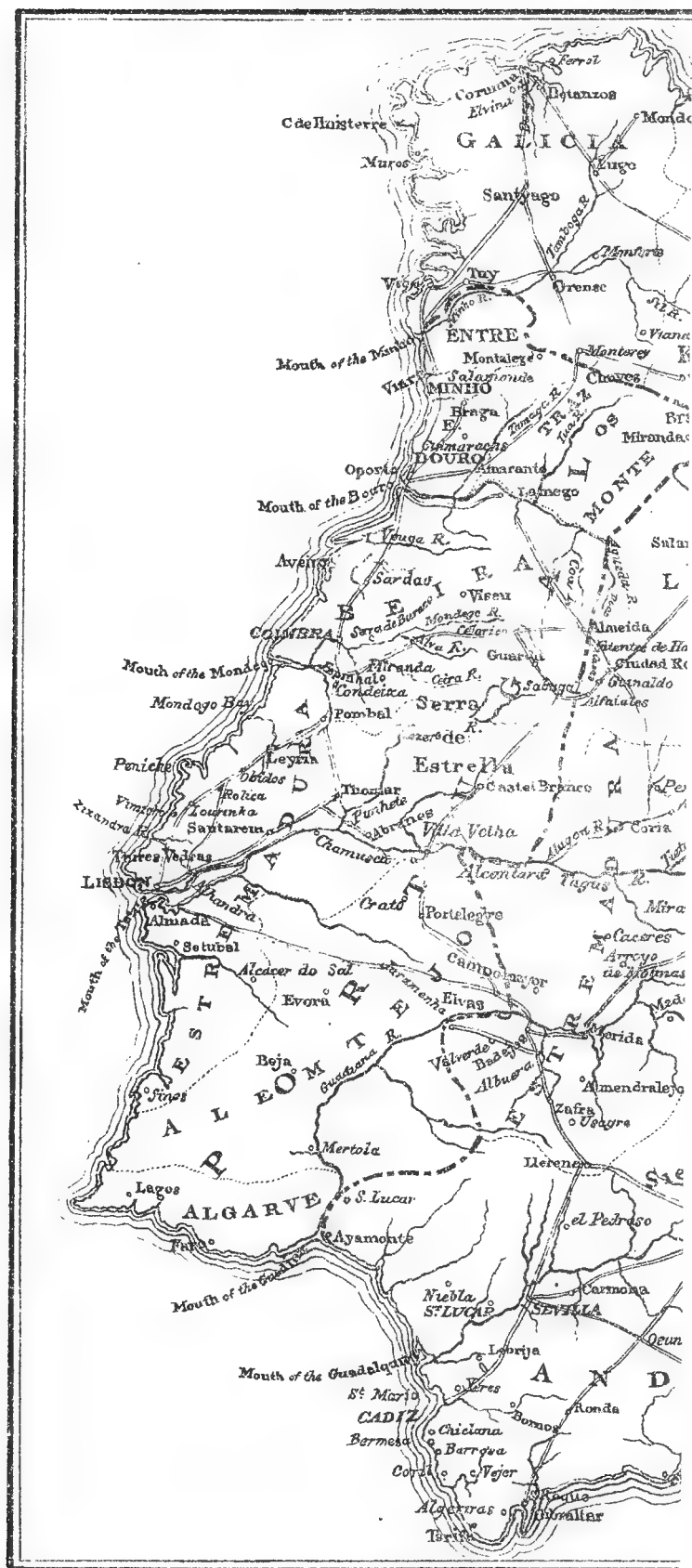
Our destination was Golega, where I got very excellent quarters, the patron¹ or master of the head-quarter billet came to pay his respects, and spoke some French and Latin. Taylor and I got round him and teased him with questions, he denied the excesses of the French, which needed no other testimony than the universal desolation of the place. We found our rations, a pint of wine and a pound of beef per man, suffice very well, and, indeed, nothing else but a few potatoes was to be had. . . .

18th September.—Marched very early (before day-break) for Gavião, and for the first time had a specimen of Portuguese hills. On the march, near Punhete, the road joins the river Tagus, which is here extremely picturesque and beautiful, the trees coming down to its banks and meeting the water's edge. We passed over an arm of the Tagus, at Punhete, by the bridge of boats, which, being removed in the rainy part of the year, is a great impediment to the advance to

¹ The master of the house in which an officer was billeted was called the "patron."—F.A.W.







Lisbon. When we got to Punhete, I was ordered on to Abrantes to prepare for our arrival there.

"The march from Abrantes to Castello Branco is over difficult mountains; to have repaired the roads between these places would have been more useful to the enemy than to the allies, as facilitating a passage for superior numbers to penetrate by the shortest line to Lisbon. But Lord Wellington, after throwing boat-bridges over the Zezere [at Punhete] and the Tagus and fortifying Abrantes, established between the latter and Castello Branco a line of communication by the left bank of the Tagus, through Nisa, to the pass of Villa Velha, where, by a flying bridge, the river was re-crossed, and from thence a good road led to Castello Branco. Now the pass of Villa Velha is prodigiously strong for defence, and the distance from Abrantes to Castello Branco being nearly the same by Nisa as by the other bank of the river, the march of troops was yet much accelerated, the road near Villa Velha being reconstructed by the Engineers." Napier, Vol. III., p. 263.—*See Map I.*

This trip on a hot day, with the thermometer at 90°, I did not admire. I did not arrive at Abrantes till it was nearly dark, Taylor and Maxwell in company; our billet was drawn from the English Commandant, nor was I ever in a dirtier hole! We all slept in a room 10 feet square, filthy in the extreme. I proposed in preference taking shelter under the canopy of Heaven in the fields, but could not carry my point.

19th September.—Was up early in the morning to draw provisions, &c. for the troop. We were obliged on their arrival to have them picketed, the stabling being occupied by the R.I.D.G.¹ Abrantes has a castle of no consequence, but if its bridge of boats were removed, the passage of the Tagus would be stopped.

Here is the grand dépôt of the army, and the mirror in which the Commissariat department may be seen.² All the stores are forwarded to the army by mules, which are pressed and become regularly the property of Government. The pay for a mule which carries about 320 lbs. of corn, or 28 gallons of wine or spirits in casks, or 280 lbs. of biscuits is one dollar per diem. To keep up the communication with the army many thousands of mules are employed. The owners take them in charge, and receive, besides the pay per mule, 18 dollars a month for themselves. A sub-commissary is generally attached to each regiment, who collects what supplies he can from the district he is in, and there are flying magazines at the head-quarters of divisions, &c., and stationary ones on the routes from Lisbon, &c. Commanding Officers of cavalry send detachments over the country for forage, and the receipt is given on the regimental, district, or divisional Commissary, as it may happen to be.

¹ The 4th, or Royal Irish Dragoon Guards.

² Lord Wellington's experience of supplying the troops by means of the *Brinjarries* during his Indian campaigns in the Deccan, no doubt stood him in good stead in organizing his commissariat supply and transport in the Peninsula. *See* his memo. on the subject of this Indian system of transport and supply. "Wellington Despatches," Vol. III., p. 535.

Forage is served out in straw, Indian corn, oats, barley, and even rye. Spirits, wine, beef, biscuit, bread or flour, sometimes rice, and occasionally a proportion of salt, are delivered to the troops. I have generally drawn the provisions and forage; the Portuguese commonly preside at the minor stores, and are rigorously exact in weight, measure, &c., and will cheat you if they can. I found much difficulty in comprehending their weights and measures.

“Portugal owes much to its poverty. The impossibility of subsisting a large army for a length of time on the resources of any limited portion of it formed the pivot on which the military operations for its defence invariably turned. The French were at no time sufficiently masters of the country to establish magazines; but subsisted on the daily contributions they levied, and never therefore could remain long united in a large body. The British and Portuguese, on the contrary, had their floating magazines on the Tagus and on the Douro, everything was drawn from their rear; and provided the line of supply was not materially lengthened, so as to require a great increase of animals which brought up the provisions, they could act as well in one part of the country as another, and for any length of time. The enemy during the whole of 1811, possessed a great numerical superiority, and could alone have been prevented deriving some advantage therefrom, by every movement of the allies being conducted with a happy reference to the difference of the commissariat of the two armies.” “War in Spain and Portugal,” by Lieut.-Col. J. T. Jones, R.E., p. 216.

This night we slept, for the first time, under canvas, in which I found no hardship. Our dinner was spread on a tarpaulin, and but for the faces of friends that should have sat round it, I could have despised the wish for mahogany claws. I bathed in the Tagus, the current is extremely rapid.

20th September.—Was employed the whole day in drawing corn and provisions for three days, during which occupation I was witness of a circumstance which might have been of serious consequence. A soldier of the 47th regiment, who was left with some meat that had been drawn, was attacked and overpowered by some hungry Portuguese. What was the origin of the quarrel I never could discover, but multitudes had the man down and were stoning him, when two or three of his comrades came to his rescue, and soon chased away the Portuguese, some of whom got most heartily drubbed with no other instruments however than fists; being in sight, I ran up with all possible speed to prevent a disturbance, and got to the butcher's shop just in time to overturn a Portuguese in the act of priming his musket to take revenge for the licking he had received, and on my walking out with it in my hand, the people soon dispersed, for they have great respect for an officer; though at Abrantes we seem to be less popular than where we have been before.

This night whilst we were all snug in our tent, and the men under the guns, there came on what is called a “Portuguese shower,”

Anglice, such a storm for eight hours as never was witnessed by Englishman before. The tent did not keep it out half-an-hour, but I threw my tarpaulin over me and defied the storm. I was dressed before daylight, and when the "turn-out" sounded, was soon half drowned in getting the troop harnessed. The few men who had pulled off their boots and set them upright were fair subjects for laughter, except that it was too serious a matter for joking, for when they tried to pull them on in the dark, they were astonished to find them full of water. We left at the general hospital at this place 11 sick.

21st September.—The morning turned out delightful after the rain, and the novelty of the scene in the altered face of the country almost made us forget the drowning of the night before. We now passed over hills and by the sides of mountains covered with arbutus and myrtle, beautiful heaths and other shrubs whose names, except the *Estava*, I did not know.

To my great mortification one of my troop horses died to-day, and one of Newland's likewise on the 19th. Last night's drenching made a strange alteration in our horses, but did not affect the men so much as I expected. At Gavião the troop was again picketed, and we consumed the last of the hay we drew at Abrantes.

22nd September.—I was sent on this morning through the most barren, neglected district that was ever beheld. The country had a very strange appearance in consequence of the immense blue rocks of stone that were everywhere to be seen; on these stones instead of in barns, the people beat out the grain from their fields, and cover it up with straw. When I got to Nisa, which stands high, I found our Irish friends again in the way, and we were once more to be on the ground. No forage was to be procured here, but I went out in the midst of a heavy rain, and discovered hid in a valley enough for four days' consumption, and loaded every horse.

Nisa is an archiepiscopal city, and its convents have been grand, but the iron hand of war has here left its marks in the form of ruin, poverty, sickness, and desolation.

23rd September.—Still at Nisa endeavouring if possible to lose the Dragoon Guards, but as they marched by squadrons this plan became abortive.

Maxwell was here with us, but preferred his billet, having obtained covering for his small number of men; our protection was the shade of cork trees which grow like oaks, and much resemble them, the bark can be pared without injury to the tree.

24th September.—This day's march was by far the worst we had encountered, the mountains we had to cross, and the sudden ascents and sharp turnings in coming down the hills required much labour and perseverance on the part of both horses and men. I was waiting as usual to bring up the rear, and had much to encounter. The wildness of the scenery here is beyond description, so grand and mountainous, but between the heights the valleys though uncultivated, are luxurious in their way. Early in the morning the mountain peaks are only to be

seen above the clouds, which produces a very striking effect. We passed the Tagus at Villa Velha by a bridge of boats, it was at this place that poor Johnson¹ was lost in attempting to ford, the rapidity of the stream bore him and his horse away, and it is supposed that he was struck by the animal's feet, as he was a very good swimmer, and swimming might have saved him; his name is cut on a tree by the road side, where he was found and buried by Captain Bull² 10 days after his unfortunate catastrophe. I walked all day in the sun for forage, and could only get the stalks of some Indian corn.

25th September.—Marched for Sarnadas with foraging parties on both flanks of the route, they were very successful and brought in a great quantity, but my heart bled to be obliged to take it from the inhabitants; the poor half-starved wretches implored me to spare it for their sheep, which as well as their goats they keep to milk, and live on the cheese which is very bad. I gave them a full receipt, wishing rather to err on their side in the weight, which it was impossible to ascertain; these receipts are all paid to the 1st of July.

Captain M. sent me on after dinner to Castel Branco, where I again overtook Maxwell and partook of his quarters. The town was so full of cavalry detachments, sent there to recruit their strength, and the R.I.D.G., that it was 10 o'clock before I could get my horses put into a stable, and at last only through the charity of an officer of the 11th, who let me crowd his own horses by the addition of mine.

26th September.—Fortunately the troop found quarters in consequence of a sudden order for the Dragoons to march, this order put us all on the alert, and we immediately inspected our guns, &c. We were again under the necessity of leaving 12 men behind, we however got the use of some of Captain Thompson's company, and we made useful some horses last sent up the country. Castel Branco is a large town on an eminence, with a castle of little use, it forms a strong position on the frontier next to Pena Macor.

27th September.—Marched and got to Pedrogão early, and encamped under the shade of cork trees. Late in the evening, Colonel Sherlock of the 4th R.I.D.G., received information that French cavalry had pene-

¹ Lieutenant William Johnson (Kane's List, No. 1303), of Captain Thompson's brigade, was drowned in fording the Tagus at Villa Velha on 14th June, 1811. *Ingleby Diary*, R.A.I. "Proceedings," May 1893.

² Captain Robert Bull (Kane's List, 845) served in the campaigns in the West Indies, 1796-8, and was nine times engaged in the Island of St. Domingo.

He commanded "I" Troop (now "I" Battery), R.H.A., which was formed under his supervision, from 1806 to 1823. He served with it in the Peninsula (generally attached to the cavalry) from March 1809, to the close of the war in 1814. On several occasions he was absent owing to wounds, when 2nd Captain Norman Ramsay acted for him. During the war the troop was engaged in six battles, five sieges, 21 actions, and 28 affairs and captures; 60 engagements in all.*

Major Bull was with his troop at Waterloo where it performed important services, especially at the beginning of the battle, and it suffered heavy losses. He received the C.B. and K.H. and Order of St. Anne of Russia, and was made brevet Lieut.-Colonel for the campaign.

On giving up the command of the Horse Artillery at Woolwich in 1834, he was presented with a handsome piece of plate by the officers serving, and who had served under him, as a token of their esteem for his character as a soldier, and regard for him as a friend. He retired the same year, being permanently disabled from further service, the result of wounds received during his long and distinguished career. He died at Bath in April 1835.

*MS. record of troop service which belonged to Major E. C. Whinyates, who succeeded Lieut.-Colonel Bull in command in 1823.—*F.A.H.*

trated within a short distance of this place; which communication induced us at that time of night to get to the store and draw three days' forage and provisions to carry us on; on this service I was up all night, and at 3 o'clock in the morning the troop turned out. One of Harding's troop horses was destroyed this day, in consequence of a kick which broke his thigh. He left three at Castel Branco and received five cast horses. Newland left one and received four, I left two and received four. N. lost a mule stung by a viper on the side. .

28th September.—Our route was to Val de Lobo, but missing our way, as well as the Dragoons, we went through Pena Macor, where in the middle of the town an infantry regiment, the Buffs, crossed our line of march and delayed us nearly an hour. In descending the steep hill through Pena Macor, No. 2 ammunition wagon overpowered the shaft horse, and he was precipitated clean through a wall three feet thick, neither man or horse being hurt. We halted in the middle of the day at Meimoa, but hearing of the probability of an action, and fearing that there was a possibility of the French cutting us off, knowing that they had cavalry in the neighbourhood we marched again at 5 o'clock in the evening, and marching all night got to Sabugal at 3 o'clock, regularly escorted by the Dragoons. During the night, in order to get my forage cart along, I was obliged to go back on foot four miles, and did not see a soul the whole way; this was a trying moment, and I thought of England and those I prized most who were at a distance. When I met the carriage, much exertion got it up the tremendous hills. It knocked up six horses and also repeatedly stopped, and I had not only this difficulty to oppose, but the impatience of the Dragoon officers who were the rear-guard. On getting to Sabugal our tents had not arrived, and I very quietly laid my mattress on the ground, spread my tarpaulin over me, and went to sleep, the dew that fell was immense, but I felt no inconvenience. No. 6 gun was overturned on the side of a hill, and the wheel driver much hurt. .

29th September.—We found ourselves packed to such disadvantage when daylight came that we immediately changed the place and occupied a hill overlooking Sabugal, to get to which a bridge passes the Coa. It was near this place that so many French were destroyed in passing the river, by our advanced-guard, when Masséna retreated from Santorem.

This occurred on the 3rd of April, 1811. Lord Wellington wrote of it thus:—"We have given the French a handsome dressing, and I think they will not say again that we are not a manœuvring army. We may not manœuvre so beautifully as they do; but I do not desire better sport than to meet one of their columns *en masse* with our lines. The poor 2nd Corps received a terrible beating from the 43rd and 52nd on the 3rd They tell me that the 2nd Corps lost 2500 on the 3rd at Sabugal! Their loss must have been enormous certainly, but I can hardly believe so many." "Wellington Despatches," Vol. VII., pp. 424-441.

We got intelligence here of a gallant action fought at the advanced

posts on the 27th, between the enemy's advance and our light cavalry, combined with Captain Bull's and Lefebure's troops. The 5th regiment were twice charged by a regiment of Chasseurs, and then walked up to the cavalry with their bayonets, a thing new in the annals of war. The 11th and 14th Dragoons, and the Coldstream Guards behaved gallantly, and the artillery did much execution. Poor Dunn¹ of the latter was brought into Sabugal wounded in the groin; he was picked out by a rifleman. No accommodations are contrived in this army to convey the sick and wounded to the rear, and I sat with Dunn some hours, concocting plans for conveying him easily, and had a cot constructed to swing in a wagon for him—he was wounded before in Egypt, and has seen much service.

The actions referred to were those of El Boden and Aldea de Ponte. Marmont, who had received a reinforcement of 11,000 men from France, having thrown a convoy into Ciudad Rodrigo, which had been blockaded for six weeks and wanted food, observing the extended position of the allies, crossed the Agueda and attacked them on the 27th of September, at El Boden and Aldea de Ponte. At the former place the cavalry of Montbrun cut down some Portuguese gunners and took two guns, when suddenly the 5th Regiment, led by Major Ridge, charged into the midst of the French cavalry and retook them.

At Aldea de Ponte, the French were at first successful, but eventually were repulsed. In the night Wellington fell back and occupied on the 28th a new and strong position, on the same day the French, who had but a few days' provisions, and could procure none in the country, also retired, and Marmont resumed his old position in the valley of the Tagus. *See Napier, Vol. IV., p. 234 et seq.*

30th September.—Marched to Val de Lobo with a guide, having received orders to attach ourselves to the 7th Division² under Major-

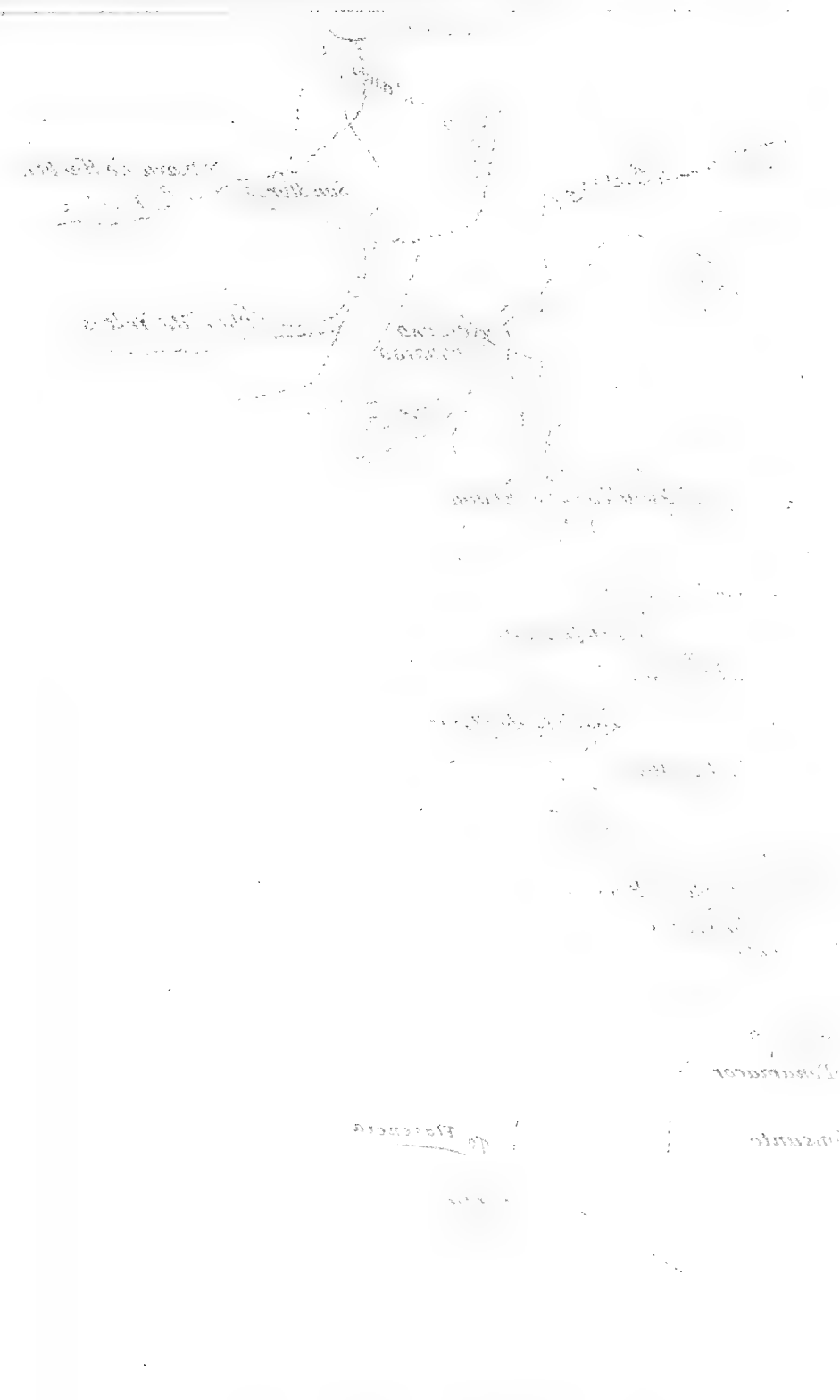
¹ Lieutenant William Dunn (Kane's List, No. 1188) served in the campaign of 1805 in Italy, was present at the battle of Maida, and capture of Scylla Castle in 1806, and at its defence in 1808 greatly distinguished himself. He served with the expedition to Egypt in 1807, including attack on Alexandria and Rosetta, and the battle of El Hamet, where he was taken prisoner.

He served in the Peninsula in "A" Troop, while his own, "D," was refitting in Lisbon after its disastrous voyage from England, and was present, in 1810, at the operations between the rivers Agueda and Duas Casas, at Almeida, at the affair on the Coa, the battle of Busaco, and the lines of Torres Vedras. He joined his own troop when it took the field in 1811, was with it at the battle of Albuera, and the affair of Usagre. At the affair of Aldea de Ponte (severely wounded), With General Hill's corps in Spanish Estremadura, at Ribera, and many other affairs. He served in America in 1814. Major-General Dunn died in 1863.

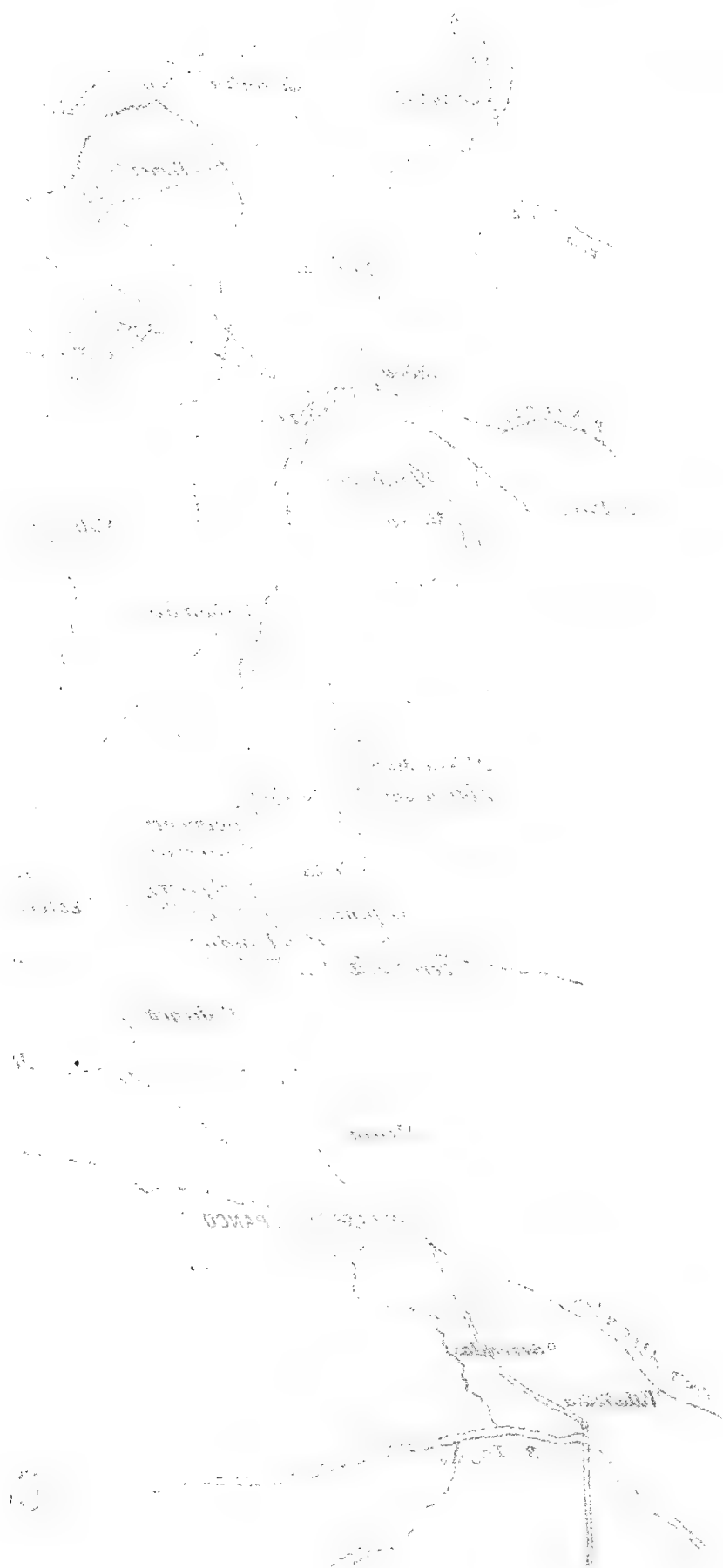
² There were eight divisions in the army known among the troops by the cant names as below:—

Light Division—		The Division.	
1st	"	The Gentlemen's Sons.	
2nd	"	Observing Division.	
3rd	"	Fighting	"
4th	"	Supporting	"
		After the affair in the Pyrenees, they were called the Enthusiasts.	
5th	"	Pioneers.	
6th	"	Marching Division.	
7th	"	They tell us there is a 7th, but we have never seen them.	

"Diary of a Cavalry Officer," p. 133.



MAP 2.
 THE
 COUNTRY
 ROUND
 THE GULF OF MEXICO & CUBA.



General Sontag, which has retired to Pena Macor, and both armies seem tired of the campaign—the French having returned to Salamanca, and Lord Wellington having taken up the position of Guarda, where report says the army is likely to remain for the winter.—*See Map II.*

1st October.—No pheasant shooting this day, but a hot ride to Pena Macor to report the state of the troop to General Sontag, and arrange the communication with him and the commissary. No corn in store for the horses, this being the third day without it; our parties bring in much straw and hay, but no corn.

2nd October.—Went shooting, and saw swarms of red-legged partridges. Val de Lobo stands encompassed with hills on one side and a high mountain on the other, and would be a fertile valley if that epithet were in the Portuguese dictionary, or rather if labour were no longer its parent. Wolves, wild boars, and deer abound in these mountains, but scarcely any one but the goat-herds, who feed their flocks in the mountains, ever see them. Their way of feeding here is rather singular: they burn the brush-wood in patches for a considerable extent, when the herbage immediately springs up, and they wander in this manner from place to place in their district in search of fresh pastures. When the people saw us march into Val de Lobo they expected, judging from our retrograde movement, a visit from the French, and fled to their fastnesses and dug holes for their treasure, for many of these unfortunate wretches who have not bread to eat have still a collection of money. They have begun to drop in with a mule or a jackass, and are on excellent terms with us.

3rd October.—An order from General Sontag to reconnoitre a road to Valverde and make a plan and general report of the country; this is an engineer's task, but on the principle of "nothing venture nothing have," I volunteered the job, and Taylor accompanying me, we set out in the hardest rain that ever poured, and were unable to make a single observation as we went; we were thus situated eight hours, and after dark, having a guide, got to Taletia, in a district hitherto little known. Here I cried a halt, and the Juiz de Fora put us into a priest's house, where we received great attention. I had very cunningly, as I thought, brought a change in my saddle-bags, but they were wet through, my bed being on my mule, with my tarpaulin over it, fared better, so that having cooked my supper I made a good night of it. The fare the priest set before us was goats' cheese and water-melon, neither of which serve to fill the little gaps that hunger occasions. I had taken the precaution to bring a camp-kettle and two days' rations. I would have given something for a glass of wine, but spirits, which are all we can get now, I cannot bear. I had a firm friend, however, in my chocolate pot and canteen, all of which the mule does me the favour of transporting. I should not forget to mention the rapidity of the brooks which rise suddenly with the wet and become formidable obstacles in a road; in passing one of these we carelessly went over before our guide, who took the opportunity *de s'eloigner*, and one of the men had to gallop some distance before he could bring him back; when he arrived at the brook he was obliged to go up to his middle in water, and like a true

Portuguese cried like a child, and it was not until I uncovered one of my pistols that he would stir. As he shared our fare, he got into a good humour at last and became very sociable, and out of compassion I took him up behind me, which restored his temper entirely.

Our intelligent and hospitable priest let us into the whole secret of the fertile valley of Valverde; these are the proper people to gain information from, as they refer to the parish books, which may be reckoned "a tell truth," he said he would inform me as to the number of inhabitants by those he confessed.

4th October.—Proceeded to Valverde, and from a tour undertaken with the assistance of a friendly priest, together with the help of the Duke of Richmond's name¹ and a letter of Lord Wellington's aide-de camp, found materials for my report. Sutton was sent back in the meantime to prepare dinner for us half way to Val de Lobo, we overtook him by 3 o'clock, and made a famous repast with the aid of a pumpkin, which is an excellent fellow in soup. We arrived at Val de Lobo at 8 o'clock in the evening.

5th October.—I was employed all day in drawing my plan and writing my report to the Quarter-Master-General of the division. . . .

6th October.—Rode to Pena Macor with Captain Macdonald, and found General Sontag ill and about to return to Lisbon. General Baron Alten now takes the command. General Leith has the division but is absent, it consists of two English² and two Portuguese regiments, Les Chasseurs Britaniques, Duke of Brunswick's Oels light infantry, and two light battalions German Legion.

The plan of the road was made to and through Valverde with the intention of ascertaining if artillery could assist our division in a project of surprising some troops in the neighbourhood of Plasencia. It was given up on account of the withdrawal of those troops, for which I am sorry, as activity and opportunity are all I wish for at present. My report, however, is forwarded to the Quarter-Master-General for his information; much good may it do him, but I should have taken more pains and more time in the drawing part if I had known it.

7th October.—Sent out to find a road from Val de Lobo to Pena Macor without crossing the mountains, which are formidable to artillery, in this object I met with success. I took my gun and "Clara" with me, in hopes of meeting with a sort of grouse that General Sontag had described to me, but did not succeed; the red-legged partridges are numerous.

8th October.—On duty and confined to Val de Lobo. Captain M. very unwell with flux. Men sickly. A little corn arrived very seasonably to-day. Two horses dead since our arrival here.³

¹ Lieut.-General Charles Duke of Richmond.

² The 68th and 51st Regiments.

³ The mortality among horses in the Peninsula was great, Lord Wellington writing to Lord Liverpool, May 23rd, 1811, thus refers to it. "It must be recollected, however, that the Peninsula is the grave of horses; I have lost no less than twelve for my own riding since I have been here, and many more of an ordinary kind." Despatches, Vol. 7, p. 598.

CHAPTER III.

Change of Quarters. Life at Salgueiro. A Visit to "I" Troop, the Light Division and "A" Troop.

9th October.—Captain Macdonald having gained permission to change our quarters anywhere within the limit of the division, I was sent out on a two days excursion to find a fit place for the purpose, but was fortunate enough to find Salgueiro half a league¹ from Val de Lobo well stocked with straw and hay, and in three villages that I searched contiguous to that place there is sufficient of it for two months consumption. I therefore returned the same day in time for dinner.

10th October.—Employed myself in writing up my journal and settling accounts, as well as arranging my writing-desk, an employment of great importance.

11th October.—Captain Lefebure² and Assistant-Surgeon Ambrose³ came to visit us, and stayed dinner. A report is very prevalent to-day that we shall all be employed in the Alemtejo,⁴ though all operations seem to be suspended for the present. We have great apprehensions of sickness in this quarter.

12th October.—Rather troubled with a headache, which was not decreased by idleness. I may however say that a conversation with a French *émigré* who passed through was not disadvantageous to me, many of these are employed in the commissariat department, and in confidential situations; this man had in charge the military chest.

N.B.—Apropos of Captain Lefebure, remember in coming into action, when cavalry is likely to come up unperceived, not to let the limbers of the guns turn or drive farther from the trail than to admit of the guns being worked without the handspike.

13th October.—Being Sunday, part of the service was read at the Park.

14th October.—Being on duty, commenced by reading the funeral service over a driver, William Weeks, who died of dysentery after a lingering illness. We are obliged to bury in the fields, for the Roman Catholics do not permit heretics to mingle their dust with their own more sacred remains. The Portuguese method of interment is disgusting, the corpse is buried without a coffin, and having stripped it of its clothing, they then stamp on it in the most indecent manner that can be imagined. Funerals are familiar objects in these climes; the

¹ A Portuguese league = 3.84 English miles.

² Captain George Lefebure (Kane's List, No. 867) served in the campaign in Flanders in 1793-4. In the Peninsula from 1810 to 1812, he was present at the battle of Albuera, affairs at Usagro, Aldea de Ponte, Ribera, and many minor combats. He died on October 22nd, 1812, at Madrid.

³ Assistant-Surgeon James Ambrose (Kane's List, No. 116) served with "D" Troop throughout the war in the Peninsula. He was with it in the Waterloo campaign, and in the Army of Occupation in France.

⁴ Alemtejo or Alentejo (beyond the Tagus), the largest and most populous province in Portugal.

villages are full of infection, which shews in the shape of typhus, they call it *maligna*; their state of starvation and natural filth combine in cherishing this disorder.

I have learnt since writing the above that the rich who can afford it repose their ashes in sumptuous coffins.

15th October.—Rode by Captain M.'s order to investigate a road, an occupation I shall henceforth dignify by the appellation of "fool practice." I lost my dinner in consequence of having the Commandant as a companion, for he did not reflect that his state of health made his appetite no fair one by which to weigh mine. It is here to be understood that I do not grudge my time or labour when usefully employed, but I do not conceive that buying goats and surveying cattle are at all essential to what is called ascertaining a road.

16th October.—I was engaged again in a party of "fool practice," but knowing that bullock wains were much wanted, and that all the attempts to procure them had hitherto failed, I volunteered the task and returned two hours after dark with four well loaded with forage. Of all the duties I have hitherto performed, this is perhaps the most disagreeable. One cannot but sympathise with those who are obliged to leave their farms, children, wives, &c. to join the commissariat train, but such is the unavoidable state of affairs, and the army cannot starve. The pay of the drivers of these wains is more than they could earn at home, and their provisions good, as they have the same rations as the soldiers, which are likewise those of the officers, viz. : 1 lb. meat, 1½ lb. bread, or more frequently 1 lb. biscuit, and ½ pint rum, or a pint of wine, which with the labour a cavalry soldier has, is *muito pouco*. To catch these drivers is not such an easy task as to feed them. My plan was first of all to bribe the Juiz de Fora or magistrate and compel him to come with me. I had two mounted men, no sword or arms myself. I then went to the top of a high hill, made my observations where they were at plough, then crawled under cover of the hedges, or more properly speaking of the brush-wood, to the spot, and took them by surprise. In some instances I sent some men, having four others in reserve, round by one route and went myself another, keeping senhor Juiz, whose authority is indispensable, always at my elbow. On seeing you the peasants immediately unyoke their oxen and make for the mountains. I however had reconnoitred the roads and had my videttes, so that many did not escape on this occasion. I was at one time master of 20 beasts, but I let all the old men go, and also those that the Juiz assured me were very poor and had families. My difficulty now was to find wains, they all swore they had none, I took them however to the village they belonged to, Mineressa, and after much search and good usage they produced four, which were all I detained; they were soon quite reconciled and did not think it a great hardship. The law excuses from these services such as have three sons soldiers; for this the Juiz is responsible; this gentleman knocked up several times, but I went along with him and kept him to it. My way this day was perfumed with gum cistus, arbutus, laurestinus, and other shrubs, and the mountainous scenery was highly picturesque, the cul-

tivated spots are merely where these shrubs are burnt and cleared away. A Portuguese with a grin of satisfaction pointed to where some Frenchmen had been murdered by them.

A non-commissioned officer went on the same duty in which I was employed and left a man in charge of a wain, who was foolish enough to follow it by a road he did not know, and two countrymen with muskets took it from him. I found no disposition in the people to use violence, which they might have done repeatedly, as I always went to them alone in the first instance and unarmed.

17th October.—On duty this day. Our duty days are not the eventful ones, as we are generally on those occasions confined to quarters instead of pursuing forage, &c.

Letters received from England, but my friends have I suppose long before this forgotten me. Dyneley writes from Lisbon, and mentions the death of Gunner Bartleman. The system which prevails in this army of hurrying the sick to the rear without suitable means of transport or medical attention is an evil that humanity should find a remedy for. The 2nd Captain himself mentions that he fears his constitution is unequal to the climate, and his surgeon presses this opinion very strongly.

18th October.—Captain Lefebure's troop should have marched through Val de Lobo to-day for the Alemtejo, but made a halt instead, and we had a merry meeting. Lost a horse of my division that came from Castel Branco.

19th October.—Got up before daylight to see Lefebure off, contrary to my advice, which was given from actual knowledge, he tried to march to Pedrogão by Meimoa, but failed on the hill between the latter and Val de Lobo. Artillery on the route from Sabugal, or Guarda, should march by Mineresa and make that their halting place, instead of Val de Lobo, but to go to Castel Branco from this front, a route may be given by Capinha, Atalaya, Alkains or Mineresa, Pedrogão. When on the Pena Macor side of Sabugal, by Castaneros or St. Estavão. After conducting Lefebure to Mineresa, I returned and started after an early dinner to Salgueiro, but not arriving till after dark I lost my way, got into the mountains, and my horse stopped just in time to save my life on the edge of a precipice, on which a flat road terminated. I then made for a light and found some mountaineers encamped round a fire, but they were very cool and refused to act as guides till I got off and loaded one of my pistols, when I found them reasonable and civil.

Wrote No. 5 to Henry and a letter to Y. Walcott.

20th October.—The troop marched into Quinlai, I having previously appointed the head-quarters of its cantonments within a quarter of a mile at Salgueiro. Every officer but myself were decently accommodated, but I am in a priest's house of the lowest order, and he seems disposed to honour me with too much company. The old bull-dog in Harding's division died this day. The Quartermaster-Sergeant returned from Castel Bom with a seasonable supply of the needful. Much forage in this village, good stabling, but bad quarters.

21st October.—Removing quarters to Salgueiro, where we have the

casa of a Marquis to live in. It is comfortable, but too small for us all; when I write comfortable I mean clean, for the panes are out of the windows. The Marquis and family inhabit part of the house, they are obliged to keep their movables in concealment in the mountains, as when they last fled some of their valuables were betrayed and shown to the French, who availed themselves of the opportunity, and took away all they could get in the house, farm, etc. Our host's situation I can easily fancy to be romantic, but farther than its exciting comparison for fellow creatures who are not positive sufferers, it is not affecting, for there is little in point of difference in situation to distinguish these nobles from their servants, though these indeed could read and write their own language. Beauty in distress claims the tears of knight errantry, but I believe in most novels that I have seen it was generally accompanied by cleanliness and education, and always by sensibility. The day was spent in getting in forage. I had great good luck in discovering it; horses are still without corn.

22nd October.—A true commissariat tyranny was called to our aid to-day, which was the enforcing a requisition on the Juiz de Fora of the neighbouring villages for all the Indian corn that could be found; for this purpose a search is made and it is all seized. All I can say in extenuation is, that it is better to supply their defenders even with the necessities of life they need themselves than to have their houses pulled down and their lives endangered by the cruelty of their neighbours. I pressed several bullock wains this day. The horses had 10 lbs. of corn. We lost one mule and five horses since coming to this place. .

23rd October.—My employment with the troop from daylight to sunset repeated this day; most acceptable.

24th October.—September's pay received this day, not before wanted. The "patron" honoured us with his society at dinner, and the ladies to tea bedizened with rings, but otherwise meanly dressed in woollen habits.¹

The first entry in the book containing the Reminiscences is the account of life at Salgueiro, it has no beginning, being probably carried on from a book that is lost. I have therefore conjecturally supplied the first sentence which is given in italics. That the writer did not intend these to be more than an occasional record of his personal observations and experiences is evident from the following extract from one of the MSS. referred to.—*F.A.W.*

"I do not set up to write a continuous history of marches, bivouacs or battles. I shall only use battles by way of occasional subjects for commentary, or as illustrations of individual adventures. To those who have served with light infantry divisions or cavalry brigades, the fact of being shot at by the enemy has a monotony about it from its frequency which would not embellish my plan. I got through these matters as well as I could, much the same as other people, and these events have been so ably handled before my time by others

¹ At this time in England ladies wore either silk or satin dresses, other materials were not considered suitable for gentlefolk.—*F.A.W.*

who have moved in the higher walk of historical occupation, that the only dread I have is that I may touch upon something which has been written about before, for we have had within the last 30 years military and naval history, aye, and biography too without end."

*During the winter of 1811, in Portugal, we inhabited part of a house belonging to a Portuguese Marquess in the village of Salgueiro. A large room was occupied by some of us which served as a library, and there was a long book-case with heavy volumes on ecclesiastical subjects, these we did not indeed read, but we turned them to good account by pushing them suddenly back and crushing the rats which congregated behind them, and seemed more familiar with the leaves than did Don Juan, who with his mother, wife, sister and such a handsome niece, seemed to think themselves honoured and happy at having us with them; our presence at least secured them from other intruders. These simple people lived principally on Indian meal bread (better known now in England than it was formerly), chocolate manufactured at home, haricot beans, *Bacallao* or salt fish, a plentiful supply of pears and grapes suspended from the ceilings of the rooms, muscovado sugar,¹ and an inexhaustible supply of olive oil and garlic, with an occasional treat of a kid, some pork and chestnuts formed the culinary stores and riches of this family ranking as considerable owners of rural property. They of course had their home-made wine and aquadiente, a vile spirit coming nearer to spirits of wine than anything else to which I can compare it. But if I forget a good deal I have not forgotten the bright eyes of Donna Maria, the fair niece which made an inroad into more than one of our bosoms, nor how zealous was the dark beauty in teaching the Portuguese language to those who would go to school to her. In return we undertook to teach her English, which I cannot say we did with that commendable fidelity which would have better become us. I fear we rendered Portuguese of which we were asked the English, into all sorts of ridiculous expressions, causing the most ludicrous dilemmas that can be imagined. I do not think this was justifiable, but I have bound myself to speak the truth, and this was one of our follies, yet on the whole our conduct was most gallant and decorous.*

We had a frequent visitor, indeed for some time a daily one, in an Irish priest, at least he was half Irish half Portuguese; there are many remnants of Roman Catholic refugee Irish families both in Spain and Portugal. This gentleman's attention to us was very great, but we soon remarked that the hour he could best spare from his more serious avocations of performing mass, hearing confessions, etc., was the same at which we dined, and as he became a bore, we changed the time, but he with a surprising facility accommodated himself to this change fast days and all. At length we told him with a very serious face that out of respect to him as a Roman Catholic we had so far abstained from the prayers which we usually said before dinner, but our consciences would not allow us to omit this duty any longer, "vary vill" said the Padre, and very piously down on his knees dropped he, while we were engaged in a mummary which he as little understood as we prob-

¹ Unrefined raw sugar.

ably should have done the due performance of his most serious services.

Finding his Catholic piety was of too liberal a nature to despise our Protestant observances, it was decided that the Doctor should be called on to supply as large a dose of jalap as one being of mature age could swallow with any chance of remaining in this world, and this was to be infused into the Padre's soupe and bouilli the next day.

I sat next the tureen and was intrusted with the precious draught, and faithfully did I perform my duty, but by some mistake the mixture was conveyed to the Commanding Officer! In vain did we watch our ecclesiastical friend for those distortions which we had anticipated would shortly seize his reverend countenance, calm and serene he replied over and over again to offers to help him to renewed platesful, "of you please," and all was quiet. Not so with the Major, who though he bore with heroic fortitude for many hours the tortures, for which he was reserved, yet in the night (many of our men having died of the dysentery) he called up the Doctor, who with a most hypocritical face felt his pulse and mixed him up something as innocuous as Dr. Malpett's small doses of magnesia.

It was many years afterwards and when no longer under the command of the Major, that I ventured to apprise him of the unfortunate mistake, from the effects of which it took him several days to recover.

But I would not say the circumstance was not beneficial, for from that hour he adopted a diet which perhaps saved him from many an indisposition thereafter, for from henceforth he constrained himself to forego all the luxuries of grapes and pears during his mortal stay at Salgueiro.

But to return to the Padre, he was not allowed to come off scot-free, indeed it became necessary to induce the Major¹ to believe that he was afflicted by an epidemic that had attacked someone besides himself, and who so properly as our reverend friend? Accordingly a dose still stronger was prepared for his bodily solace, this time the work was done most effectually, and no error in the dose reaching its right destination occurred. In the sequel it was difficult to say who was most punished, the poor priest by his wracking pains and great alarm, or the rogue of a Doctor who was called on to administer antidotes every hour through the live long night, indeed at one time we were becoming seriously alarmed.

Everything belonging to our host and indeed all his people, was scrupulously protected by us, and though we did set his house on fire, we most gallantly put it out. It has been long a military custom on the night of the 23rd December, to sit up to boil plum puddings which it is deemed amongst military cooks require at least twelve hours to bring to perfection. In this our *artistes* were engaged when the chimney took fire, "*fogo em casa*," the cries of Donna Maria, the wringing of hands and loud sobs of the other fair ones, and the lamentations of Juan, his wife hanging on his despairing bosom, "oh Juan!" were truly heart-rending, and no doubt had we not been there the patrician residence would have been burned to the

The victim undoubtedly was Captain Macdonald, he was probably a Major when this was written.
—F.A.W.

ground for not a Portuguese would have had the spirit to go within smell of it, however, with our fellows about us we had not much difficulty in getting it under. Even the pudding survived though at one time threatened with calamity, and we had the blessings of the Priest as well as the grateful smiles of our fair hostesses. One of these ladies I remember had some complaint which was consuming the rose (damask rose) on her cheek, and during our stay the Doctor succeeded in restoring its pristine bloom, but with true professional fidelity he never told us the nature of the malady or the cure.

Not myself occupying the long library amongst the learned rats, I slept at night in a small *quarto* just big enough to contain my camp bed. It had a window, but time or the French had disabled many of the glass panes, so in that land of *nil*, I soon made some glazed paper to keep out the cold at the smallest possible expense of light, but much did I rue my ingenuity, probably acquired from an erudite grower of cucumbers in some English cottage garden, when I was requested to stop all the broken panes in the spacious *Quinta*. Amongst these simple people I believe I passed for a prodigy of human ingenuity just caught from a manufacturing, machine-loving, scientific country.

25th October—Taylor set off to return to England, we lose in him a good companion and an honest-hearted fellow, I hope he is cured of rambling. Had he been here in an active time there would have been hardship enough to make home acceptable, but as yet we have done nothing.

Macdonald and Newland went off for a tour to the different cantonments. We received a report to day that the forage in a village where we have a guard had been entirely consumed, but on my examining it I found at least enough for a week's consumption. Sergeant Johnson who was away with a requisition for corn, locked his bullocks, wains and drivers in an outhouse, where they pulled down a wall and made their escape.

26th October—Rode off at daylight for Freixadas in a regular Portuguese wet day, which I have already described as being the summit of luxury; my road lay by Belmonte and Guarda, I arrived at my destination at half-past 4 o'clock, having ridden 11 leagues by dinner time, and those who travel in this country only know what such a performance is. This is the first day that has been dedicated to pleasure. I found Walcott at Freixadas. Major Downman¹ and Captain Bull's Troop. Walcott² was so kind as to entertain me and give

¹ Major Thomas Downman (Kane's List, No. 742) served under the Duke of York in Flanders in 1793-4, was present at Lamoy, Roubain, Mourveaux, and in the action near Tournay was wounded and taken prisoner. He commanded "B" Troop, R.H.A., in the Coruña Campaign, present at Sahagum and Benevente.

He commanded the H.A., in the Peninsula under the Duke of Wellington, from September 1810, to May 1813. He was present at the battle of Fuentes de Honor, affair at Aldea de Ponte, siege of Ciudad Rodrigo, battle of Salamanca, capture of the Forts of Salamanca, entry into Madrid, and capture of the Retiro. He was at the siege of Burgos, and distinguished himself in covering the retreat of the army from there. He received the gold cross, and one clasp, silver medal and three clasps and the K.C.B. Lieut.-General Sir Thomas Downman died when Commandant at Woolwich in 1852.

² 2nd Captain Edmund Yeamans Walcott (Kane's List, No. 1127), Adjutant R.H.A., served in "C" Troop, R.H.A., in the Coruña Campaign. He was appointed Adjutant R.H.A., in England in 1811. In the Waterloo Campaign, he was 2nd Captain of "F" Troop, and was especially mentioned for his gallant conduct in the battle. Lieut.-Colonel Walcott died on 28th February, 1817.

me what is termed a shake-down, viz., some blankets and hay, my ride gave them as much attraction as a bed of down, and yet I found means to lay awake and talk with Walcott for two hours after going to bed.

The road from Salgueiro to Belmonte lies across the mountains, and the morning being very stormy, I for the first time had an opportunity of admiring the wonders of nature in a mountainous country, parts at times were covered by clouds, and others encircled by the rainbow, or occasionally reflecting for a moment a ray from the sun, producing the finest effect of light and shade that can be imagined. After passing the Sierra the road descends to a vale which passes here for a well cultivated one; in this stand Caria and several smaller places which afford much forage. It then passes over the Moncul, a small river that like many others is formed from the torrents that in the rainy season run from the mountains and accumulate till they become a river. The road afterwards ascends to Belmonte, a town defended by a castle and standing on a high hill, one side of which is a nearly perpendicular precipice. At the foot of this steep cliff a river runs through a vale, which is seen for a great extent. Nature is extremely bountiful there, and the pasturage is green and of an English appearance. Belmonte is ruined more than any town I have yet seen, few houses have roofs or windows, on the road passing through there is a very antique ruin in the form of a square tower. I can scarcely trust my architecture, or should call it Moorish. The ascent and descent to Belmonte is so steep that there is a paved road cut in a zigzag form, but impassable for heavy artillery. To do justice to the rest of the road to Guarda defies all the romantic terms that are dedicated to description. It passes between two nearly perpendicular mountains, which join at the bottom like a trough with a stream running at their feet; the stream rushed from stone to stone in a torrent in consequence of the heavy rain, and was frequently beautified by falls from the mountains which passed through trees and rocks sweeping everything before them. Mills are turned by many of these temporary cascades produced by the incessant rain, the most romantic bridges are thrown across in places. The sides of the mountains are covered with cork and chestnut trees projecting from the ground in the wildest and most irregular manner; for when they grow to a certain size their roots cannot penetrate far enough to give them support, and they impend over the road in the most terrific manner. Between them rocky precipices vary the scene, some of the immense stones are so placed that the eye cannot account for their support. The road itself is the first thing that has given me occasion to relax in my opinion of Portuguese industry, great pains are taken to preserve it from the waters that rush from the mountains. The mills are all overshot ones.¹ It is remarkable that all landscape painters stick them in their pictures. What I have often imagined an extravagance of cloud and trees, I shall no longer question being copied from nature.

Guarda stands on the highest mountain in the neighbourhood, and

¹ An overshot wheel is one the circumference of which is covered with cavities or buckets, and which is turned by water which shoots over, or flows upon the top of it, filling the buckets and acting by its weight only. The largest in the world is at Laxey in the Isle of Man, it is 72 feet, 6 inches in diameter, and develops about 150 horse-power, it works a system of pumps in a lead mine, raising 250 gallons of water per minute to an elevation of 1200 feet.—*F.A.W.*

forms the centre of the famous position defending the approach into Portugal from the Tagus to the Douro. The city is large and respectable, but a great part has been burnt down by the French. Of the rest of the way to Freixadas I have only to say that it affords excellent quarters for cavalry, having much hay and straw. Guarda is occupied by the 5th division, Major-General Hay in command, and at this place, which is rare in Portugal, almost everything is to be purchased. There are some cloth manufactories here and at Covilhão.

27th October.—Enjoyed myself much this day. Walcott mounted me and we had great sport in riding over the stone walls; they consider themselves so settled here that they have built in the windows, and made stone chimneys for the purpose of fancying themselves in England by dint of looking at a fire, which at best is but smoky and only of wood. Newland and Macdonald who are on an excursion, were of the party at dinner. I should have gone back to Salgueiro to-day, but Major Downman detained me on account of the weather.

28th October.—Set out for Guarda where I had left Sutton with my mare and taken to a mule; rained the whole way but my cloak and pelisse saved my body. I was however very wet below, and when I got to Guarda I went to dine with General Hay¹ and was obliged to sit all the day in my wet things, my saddle-bags, in which I had a change, being quite wet. I had this night neither bed or blanket, and was obliged to lay my head on my wet saddle-bags, but still I slept soundly and felt no inconvenience.

29th October.—After breakfasting with the General, where I met Moorhouse of the Guards, I returned to Salgueiro. The Moncul in the two days since I passed it, had swollen nearly enough to be dangerous, and was a good specimen of the means of defence in this country at different times. I found Dyneley arrived from Lisbon, and we received intelligence of the death of Gunner Lant at Abrantes. I shall repeat no more my horror at the system of hurrying to the rear every case that requires hospital treatment.

30th October.—We received intelligence that in consequence of the wet, Corporal Batty who had gone some days before in charge of wains for corn to Cavilhão, had been taken ill and left there. In passing a rivulet one of the party only saved his life by good swimming. Corporal Millar with the heavy howitzer, broke down a league short of Salgueiro, and sent in for assistance, which I forwarded as soon as possible. I fear they will remain out all night. Wrote to Walcott and G. Smyth.²

The arrival of this heavy howitzer is explained by the following letter from Lord Wellington to Brigade-Major May, R.A., on the 5th September, 1811:—

“I had thought of attaching to each troop of Horse Artillery one of the iron 5½-in. howitzers [weight 10 cwt.], instead of the small brass howitzers they have now. Let me know your opinion whether the carriages, &c. of these iron howitzers

¹ Major-General Hay was killed in the sortie from Bayonne on the 14th April, 1814.

² Lieutenant George B. Smyth (Kane's List, No. 1299), “A” Troop, R.H.A.

are so complete that the arrangement will answer. We would contrive to give them another ammunition car to carry spherical case for this howitzer." "Wellington Despatches," Vol. VIII., p. 259.

31st October.—Foraging all day in the rain. The howitzer arrived to-day, and Gunner Nettal, Driver Eld, and one sick horse from Castel Branco. Sent Sutton to Guarda with a pack-saddle for Walcott.

Dyneley brought with him three black horses, Gunner Lowrey and Driver Phillips, besides his own people from Lisbon. Frank Chambers¹ bad with ague.

1st November.—An idle day with much rain. Sutton returned late.

2nd November.—I was awakened at daylight by an unforeseen order to march to Mineressa, and contrived, having three days' corn to draw from the store, and to pack all the stores, &c., to get the troop ready to march by 11 o'clock. Just as Captain D. was giving the word to march, our orderly, who was sent on to Mineressa, appeared with a counter-order, but it came too late for me. I was particularly clever, and sent my baggage on, the difficulty now was to get it back; however, the daily state going through the place to Pena Macor surprised Sutton with the news, and he made his appearance just as I was thinking how I should make myself comfortable without a bed.

3rd November.—Rain all day, Captain M. and Newland returned from head-quarters. We heard to-day that two divisions were ordered to the front to intercept a convoy of 8000 men who were endeavouring to throw supplies into Ciudad Rodrigo from the Alemtejo. The news is that a party of French has advanced by crossing the Tagus at Alcantara to Caceres and levied contributions. General Hill² took his measures so well that he surprised 1400, took 900 prisoners with the treasure, and is in pursuit of the rest. This was done with the loss of six officers and 50 men killed and wounded. The cavalry is in pursuit of the remaining 500, who have taken to the mountains.

This was the surprise at Arroyo de Molinos. "While Rodrigo was being blockaded, General Hill co-operated with the Spaniards in Estremadura against Drouet, who at first joined Girard, but after various movements returned to the Morena, leaving his colleague at Caceres between the Tagus and the Guadiano. Hill advancing from Alberquerque drove him from this place on the 26th October, and hoping to cut him off from the bridge of Merida moved by a cross road next day. On the march he heard that Girard had halted at Arroyo de Molinos leaving a rear-guard on the Caceres road, thus showing he knew nothing of the cross road movement, and looked only for pursuit from Caceres. By a forced march Hill moved to within one league of Arroyo, and on the morn-

¹ His groom.

² Afterwards General Lord Hill. "He was called by the men 'Daddy Hill,' from his attention to them, being much esteemed by all ranks." "Cavalry Officer's Diary," p. 108.

ing (the 28th) attacked and surprised Dombrowski's brigade and Briche's cavalry in the place. The French force was dispersed, 1,300 prisoners, including General Bron and the Prince d'Arenberg, all the artillery, baggage, commissariat, and a contribution just raised were taken. Only Generals Girard, Dombrowski and Briche with 600 men escaped and rejoined Drouet. The loss of the allies was 70 men and one officer taken prisoner." "Napier," Vol. 4, p. 321, *et seq.*

This evening, the men with Captain M's. baggage, received from Colonel Wallace of the 88th Regiment, who was travelling with only his servant, a French soldier with his arms, who gave himself up as a deserter. We have him in custody, and are not satisfied as to his intentions; had his business been only to desert, he probably might have given himself up further in advance. He is an Italian and speaks Spanish, Portuguese, and French, his knapsack contained various articles evidently plundered, being no part of a soldier's necessities.

4th November.—Excessive rain, and an approaching scarcity of forage. The object of our intended march the other day was to have intercepted the supplies for Rodrigo, but they were too alert, and threw them into the place.

5th November.—Little worthy of remark this day.

6th November.—Rode with Harding round the country and discovered that my mare possessed the amiable quality of jumping.

7th November.—Doctor M. and the Captain went to a fair at Fundão where there was much jewellery, articles of wearing apparel, corn, cattle, and a few horses.

8th November.—Sent Sutton forward to Sabugal with my mare and bed, intending to start next day to Castel Bom, where I understood the paymaster to be, to endeavour to get some money for the troop.

9th November.—Got to Sabugal by 12 o'clock, $4\frac{1}{2}$ leagues, got on my mare, and passing through Rendou, etc. made for Freneda, headquarters, as fast as possible to save the daylight; on the road is Villa Mayor, a town standing on a sort of rock, from a cleft of which runs a romantic stream under a bridge that you pass over. It has had walls and gateways, and the ruins of an ancient castle give it an idea of romance; the houses are dreadfully destroyed by the merciless invader. I had not much time to spare in admiring its romantic appearance, and passed on through Malhorda de Surda, but in vain was my haste, the darkness overtook me and no guide was to be procured. I was thus blindly following the road only hoping that it might be right, when an officer overtook me, and seeing I was an artillery officer, asked if I did not want Colonel Framingham,¹ saying that I had passed his house at Malhorda de Surda. I was agreeably surprised with this intelligence,

¹ Colonel H. Framingham (Kane's List, No. 624) served in the Peninsula at the battles of Talavera, Busaco, Fuentes de Honor, the sieges of Badajos, and the battle of Salamanca. He commanded the R.A. on the two latter occasions, he received the K.C.B. and died a Major-General on the 10th May, 1820.

and got back just as May,¹ and Lindsay,² the Brigade-Major, and Adjutant were sitting down to dinner, the Colonel being ill in bed. I was glad soon after to get to bed in May's room, where Sutton had made the arrangements. The Colonel and party had been infamously expelled from head-quarters to make room for whom? for anybody who might come! Oh my degraded corps!

10th November.—Breakfasting early, and after an audience with the good old Colonel, I went to the paymaster, who informed me that money had arrived, and if I could wait a day or two the troop accounts might be settled. I easily made up my mind, and leaving the papers, rode over to Ross's troop at Puebla de Azava, three leagues³ off, in Spain, but through the uncommon ignorance of the people could not get directed, every one telling me they did not know even the name of the place. I have since suspected this was through fear of being taken as guides. I therefore went to Alvagaria, where I found General Picton's, the third division, and from there got to Ross⁴ in time for dinner; passed an exceedingly pleasant evening, played whist, had a billet to myself, corn for my animals, and a man to take care of my horse, etc.!!!

11th November.—Rode with my friend George Smyth to Guinaldo, where the light division lay, they were fitting up a ruined chapel, and Captain Bell, the Deputy-Adjutant-General, was painting scenes for the representation of Henry IV. on Thursday week. At this place I formed some idea of the Spanish superiority over the Portuguese; the towns

¹ Captain John May (Kane's List, No. 883) was employed afloat in bomb service from December 1797, to 10th April, 1801. He was present at the siege of Copenhagen in 1807.

He began his Peninsular service in the Portuguese Artillery, but on 13th June, 1809, became Brigade-Major, R.A., having exchanged with Captain Alexander Dickson; these distinguished officers were firm friends, and their cordially co-operation throughout the war resulted in the successful solution of many important artillery problems. Captain May, who became A.A.G., R.A. in 1811, was present at every operation of importance from the battle of Talavera to that of Toulouse, besides many minor affairs. He was mentioned in despatches for the sieges of Ciudad Rodrigo, Badajos, Burgos, and St. Sebastian. He was wounded when charging with the cavalry the French rear-guard the morning after the battle of Salamanca, and again at the battle of Vitoria.

Sir John May was A.A.G., R.A. in the campaign of 1815, he was present at Quatre Bras and Waterloo. For his long and distinguished services he received the K.C.B., the K.C.H., the K.T.S. of Portugal, the order of St. Anne of Russia, and the gold cross with three clasps. Major-General Sir John May, who was a lineal descendant of Thomas May the historian of the Commonwealth, died in London in 1847. The maps he had used during his campaigns were presented by Lady May to the R.A. Institution in 1854, one, an original map of the country between the rivers Coa and Agueda, is beautifully executed.

² Lieutenant W. F. Lindsay (Kane's List, No. 1185).

³ A Spanish league = 2.63 English miles.

⁴ Captain Hew Dalrymple Ross (Kane's List, No. 890) commanded "A" (the Chestnut Troop (now "A" Battery), R.H.A., from 1806 to 1825. He served with it in the Peninsula attached to the "light division," from June 1809 to the end of the war in 1814. He was present at the battles of Busaco, Fuentes de Honor, Salamanca, Vitoria, Pyrenees from 26th to 30th July, 1813, near Bayonne; at the sieges of Ciudad Rodrigo, Badajos, and forts of Salamanca; at the actions on the Coa, Pombal, Redinha, Casal Nova, Fox. d'Aronce, Sabugal, Aldea de Ponte, Castrajon, San Munos, San Milau; at the passage of the Bidarsoa, the Nivelle, and the Nive, he was three times wounded during these campaigns, and was made a brevet Lieut.-Colonel and K.C.B., he received the gold cross and two clasps, silver medal with three clasps, and the K.T.S. of Portugal.

Sir Hew was with his troop at Waterloo, and he received the 2nd class of St. Anne of Russia on that occasion. He commanded the troops in the northern district from 1825 to 1840, he then became D.A.G., R.A., and later was Lieutenant-General of the Ordnance. He was made a G.C.B. in 1855, and a Field-Marshal in 1867, and died as Governor of Chelsea Hospital in his 90th year in 1868.

are better built, the habitable part being all on the ground floor, and clean and neat, the kitchen utensils, etc. neatly arranged, and the people more intelligent, better clothed, though in a manner grotesque enough, with broad hats, large sack-cloth cloaks, sashes, and stockings with immense clocks. The women are of better complexion and make than the Portuguese, and infinitely more cleanly, I think love may be a Spanish passion but it cannot be a Portuguese one.

I saw here the position Lord Wellington occupied on the 25th of last September, before he retired to Alfayates, and was sufficiently convinced of its insecurity.

12th November.—I was much amused to-day by the herds of black pigs that belong to the Spanish villages, the people take great care of them, and generally kill them when about full grown, making hog puddings; they are, however, so stingy that they will not indulge themselves with the flesh, but sell it and hoard the money. The villagers consider the acorns, of which they take great care, upon which the pigs fatten, their best property, they grow upon an oak, which however does not resemble the English tree.

13th November.—Bought a greyhound from a Spaniard, and A. Macdonald¹ bought another. I sent Sutton this morning to Malharda de Surda, the money not being yet ready.

14th November.—I rode over with Captain Ross to Malharda de Surda, had all my papers settled, and was to send for the money the next day. There I heard a report that Bull's troop had defeated the French in the south. In our ride to-day Ciudad Rodrigo was pointed out to me, it extends a great way, and at the distance from which I saw it appears to have many grand edifices. It commands the valley of the Agueda.

15th November.—Amused myself greater part of the day in coursing, killing one hare. I met to-day with a singular instance of Spanish parsimony. Macdonald's patron, who is barber and physician *a la Sangrado*,² has the ague, and has suffered from it some time, and knows that bark which he can procure at Guinaldo, within three miles, will cure him, but though he allows health to be an indispensable part in happiness, and he is very rich, still he will not buy his cure, because the expense alarms him.

¹ Lieutenant A. Macdonald (Kane's List, No. 1174), "A" Troop, R.H.A., served at the capture of the Cape of Good Hope in 1806, and from thence proceeded with the expedition to Buenos Ayres, where he was twice severely wounded and taken prisoner. (For an account of his very gallant conduct on the 12th August 1806, see the diary of Captain Pococke, 71st Regiment, R.A.I. "Proceedings," No. 13, Vol. XIV., p. 510.)

He served in the Peninsula from June 1809, to July 1814, and was present at the battles of Busaco, Fuentes de Honor, Salamanca Vitoria, of the Pyrenees, and Toulouse; at the siege of St. Sebastian and the affairs of the Coa, Redinha, Pombal, Conderia, Foz d'Aronce, San Munos, Gave d'Oleron, and Aire.

At Waterloo as 2nd Captain of "H" Troop, he was severely wounded. Peninsular medal and 8 clasps, Waterloo medal and C.B., and order of St. Anne of Russia. Lieut.-General Macdonald was brother to Sir John Macdonald, Adjutant-General, and to Colonel Robert Macdonald, 1st Foot, he died in May, 1856.

²Dr Sangrado was a purely imaginary character introduced by Le Sage in "Gil Blas" to illustrate the ignorance of doctors in his day. Sangrado's treatment consisted in bleeding and administering copious draughts of hot water to his patients.—*F.A.W.*

16th November.—Rode to Guinaldo and saw a rehearsal of the play (Henry IV.), giving me a very fair expectation of being amused.

17th November.—Intelligence came from the paymaster to say that Lord Wellington would not allow a halfpenny to be issued to the troops, but had appropriated the money to the payment of the muleteers and others concerned in the transport of the provisions for the army. These people are paid at the extravagant rate of a dollar per day for a mule and a dollar per week for a man. When at the Commissary General's, I saw hundreds of these fellows standing in the streets and gambling with their dollars all day long, this indeed is practised in the streets of every Spanish village.

18th November.—After coursing unsuccessfully in the morning, I went to dine with Captain Duffey of the 43rd, and went afterwards to the play, where I was most highly gratified. Captain Kent of the 95th in Hotspur was excellent, the rest of the performers exceedingly good, and Falstaff received great effect from an officer of the 95th.¹ This division appears to have the start of the army, they have all sorts of amusements in their cantonments, coursing, cricket, rackets, fives, etc. I was invited to dine with Colonel McLeod, 43rd, but declined, I supped with Colonel Bernard, 95th, and did not get back to Puebla de Azava till daylight. I met Charles Eeles² who, poor fellow, carries poverty written in his countenance.

19th November.—Spent the morning in coursing and the evening as usual. When I looked over my amusements this evening, I thought with what little relish I entered into them, and how inferior they were in my estimation to the delightful hours I used to pass about this time last year, and experience has taught me how vain all other pleasures are when weighed in the same scale.

20th November.—Ross's troop received an order before daylight to advance to El Boden. I had decided to set off home, but having to go round by Malhorda de Surda to withdraw my receipts from the paymaster, since I could get no money, I got on my mule much earlier than I had intended. Being rather in a hurry I rode fast, and when I had got a league on my road got off my mule, when the provoking brute set off at a full trot back to the village. There was no remedy and I followed, in not a little passion, I could not catch him till he got into the stable whence he came. Here was a subject for the misery of human life! I did my business with the paymaster and got to Sabugal, Sutton having already reached it by a shorter road. Dined with

¹ Apropos of theatricals we have a good story. The late Sir William Cator, who was fond of acting, and in spare time during the siege of Cadiz, and in the lines of Torres Vedras found many opportunities, used to relate that when he played Bob Acres in "The Rivals," on one occasion at the supper which took place after the performance, he proposed that they should all go out next morning with Lord Wellington's hounds,* in the theatrical costumes in which they were then sitting. The suggestion was received with acclamation, and when carried into effect, his lordship, who was out, was much amused and laughed heartily at the prank.

* The hounds, above referred to, were given to the officers of Gibraltar, and formed, with the few they already had, the well-known Calpe hounds, which exist to this day. Since Cator's day many R.A. officers have managed them.—*F.A.W.*

² Captain Eeles, Adjutant 95th, he was killed at Waterloo.

Captain Baynes¹ and Pascoe² and slept in a miserable billet. Next morning by Castel Novo to Salgueiro. At Sabugal had intelligence of a troop of banditti formed by Portuguese deserters of all descriptions ; their plan is murder and robbery which they practise in the mountains about Meimoa ; they had infamously murdered two woman the night before by stoning them to death.

21st November.—On duty, a day worthy of no remark, except that owing to some differences whilst I was away, Captain M. and the Doctor had seceded from the mess.

22nd November.—A commissary this day joined us for the supply of the troop.

23rd November.—Poor Frank Chambers still very ill, and I am under the necessity of taking Taylor into my stable.

24th November.—Nothing out of the common way to-day. Blachley³ dined with us from Pero Vizeu.

¹ Captain Henry Baynes (Kane's List, No. 1092) was at the battle of Talavera (wounded). He was brigade-major, R.A., in the Waterloo campaign (wounded), and was made a K.H. Major Baynes died 15th July, 1844.

² Lieutenant John Pascoe (Kane's List, No. 1415) served in the Peninsula and France from August 1809 to February 1814. He was present at the battles of Salamanca, Vitoria, Nivelle, Nive, passage of the Bidassoa, and other operations, sieges of Badajos, Fort of Salamanca, Burgos, and St. Sebastian. Lieutenant-Colonel Pascoe died 23rd January, 1861.

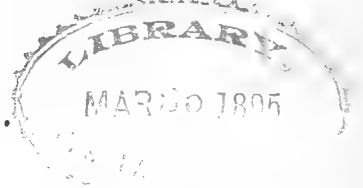
³ Lieutenant Henry Blachley (Kane's List, No. 1221), "I" Troop, R.H.A., served in the Peninsula from July 1809, to the end of the war in 1814, he was present at the siege and capture of Badajos, affair of Castrajon, battle of Salamanca, capture of Madrid, siege of Burgos and retreat from thence, affair of Osma, siege of St. Sebastian (both operations), passage of the Nivelle, actions 9th, 10th, 11th and 12th December, 1813, in front of Bayonne, passage of the Adour, investment of Bayonne, and repulse of the sortie, on which occasion he was wounded in the head by a musket ball, the last artillery officer wounded in the war. He received the silver medal and five clasps. Major-General H. Blachley died 13th August, 1868.

(To be continued).

THE STORY OF THE CIVIL WAR IN AMERICA.¹

BY

MAJOR E. S. MAY, R.A.



THOSE who read Mr. Ropes's "Campaign of Waterloo" will eagerly take up another volume by the same author, and may yet do so with a certain apprehensive curiosity. For, great as was the merit of the former work, it is one thing to write a crisp narrative of the briefest and most dramatic of great campaigns, and quite another to condense into a concise story the weary records of a four years' struggle. The talent which could achieve a brilliant success in one task might easily be found unequal to the other. We venture to think, however, that this last effort of our author's will fully answer the expectations which the popularity of his other writings aroused. It is true we have as yet but one of the promised three parts before us, and that in it we are carried no further than the spring of 1862, but the same judicial temper, the same faculty for weighing and examining evidence impartially, the same lucidity of style, which distinguished his last volume, are again present in this, and, while the old manner charms us, the matter before us gives earnest of what is to follow. The method of adding notes and discussion to each chapter of narrative, which Chesney adopted in his "Waterloo Lectures," and which Mr. Ropes has followed so successfully before, is again made use of, and the book will therefore be of particular value to those who study military history closely with a prospect, in some cases, of having their knowledge put to the test in a subsequent examination. But while soldiers can follow attentively the strategy of the war, and will find Mr. Ropes a valuable guide in doing so, to the casual reader these pages will by no means prove too technical or wearisome, but will, on the contrary, supply in a small compass a very clear and agreeable statement of the salient features of a war of which far too little is known in this country. Neither, because the bulk of the volume is not taken up with details, let the professional student fancy that its history is too general, and goes too little into *minutiæ* for his purposes. He need be under no apprehensions on that score. For the truth is that the American war affords only good ground for the study of strategy, and that but little of value as to tactics on the battle-field itself is to be derived from it. The generals who distinguished themselves in that tremendous contest had, as a rule, a keen appreciation of what has been termed "the

¹ The story of the Civil War. A concise account of the war in the United States of America between 1861 and 1865, by John Codman Ropes. Part I. G. P. Putnam & Sons, New York and London, 1894.

science of making war on the map." Lee's conceptions were often profound, and McClellan, even when wrong, displayed that imaginative grasp which aimed at great results, and would not be content with a victory, when combinations, which might work a downfall, were possible. But with comparatively raw levies and inexperienced subordinate leaders, tactics often failed to accomplish what strategy placed within their reach. Seldom, we think we might say never, was even a carefully planned battle fought out as the supreme leader intended. At the end Gettysburg was finally lost through the impatience of Pickett, and at the beginning Bull Run exhibited the uselessness of successful strategy when the means of reaping its fruits cannot be relied on. The zealous soldier need wade through no ponderous volumes, therefore, to learn all that will be of practical help to him in his career, nor need he stay to follow with strained attention the movements of each brigade or battalion. He will learn sounder tactics from the records of 1870, but he will acquire a deeper insight into the broad principles of war if he follow the schemes of Lee and Grant. And he may begin his studies by gaining a very clear conception of the exact legal and political positions occupied by both parties in the pages before us. Why the North and South quarrelled is a question, the thorough investigation of which would need a whole volume to itself, but Mr. Ropes has succeeded in touching on this subject with such adroitness as to tell us just as much as we need to know in order to understand the campaigns and no more. That the South made a blunder in the manner in which they commenced hostilities there can be no doubt. Far wiser would it have been had they allowed provisions to be freely furnished to the little garrison of Fort Sumter. Such an act of considerate forbearance would have gained them much sympathy amongst their former friends, and many waverers might have been definitely drawn towards them by such generosity. The patriotism of the North would not in that case have been aroused, as it was eventually by the roar of the Confederate guns. Lincoln and his administration in all probability would either have been attacked for feebleness and indcision, or would have been condemned for some aggressive action. As it was, the onus of civil war was made to rest on Southern shoulders, and that too in an opening fight which had little of chivalry about it. Then Lincoln affected to treat what was really war as a mere insurrection. He commanded "the persons composing the combinations aforesaid to disperse and retire peaceably to their respective abodes within twenty days." Such a view is almost ludicrous in its contempt for the Southern pretensions. For the seceding States claimed to be in fact independent nations, and they asserted that they had as much right to leave the Union as Germany or Italy has to quit the triple alliance of to-day. There was no doubt a cunning policy at work in Lincoln's mind, for to ask for troops to conquer and subdue communities which so lately had been States in the Union could not but have had an unpleasant ring about it. But, whatever was his reason, his call was responded to with an unanimity and heartiness which astonished the world. He thenceforth became the leader of a great national movement, and was supported with the same

zeal and enthusiasm which a war against a foreign invader would have called forth.

Unfortunately his knowledge of military matters did not equal his political sagacity, and Mr. Ropes nowhere displays the surprising grasp of strategy and military considerations for which he is remarkable than in his criticism of the great Federal statesman's administration of the war department. The senior officers in the army of the Union were no doubt in most cases too old for active service, and it was desirable to replace them by younger officers. But to place civilian volunteers far up in the hierarchy of military command was a widely different thing. Butler, who indeed had commanded the Massachusetts Militia, and Banks, who had been Governor of Washington and Speaker of the National House of Representatives—"both men without any military training or experience whatever"—were made Major-Generals of Volunteers. The case of Frémont was even worse. He had been an unsuccessful competitor with Buchanan for the Presidency in 1856, and he had gained some reputation as an explorer in the far North-West, but this hardly qualified him to become a Major-General in the regular army, still less to supersede the brave and capable Lyon in Missouri. A national crisis is scarcely the time to satisfy embarrassing claims or reward political services by the gift of appointments which involve such vast responsibilities as the commands of armies, and the National cause undoubtedly suffered severely when duties, on the intelligent management of which everything depended, were entrusted to inexperienced men. Neither Lincoln's acumen or patriotism seem to have been equal to the occasion here; possibly he may have been imbued with something of that jealousy of military rank which then tinged popular feeling in America, and has not always been unknown over here, but more probably it was what Dr. Johnson would have termed "sheer ignorance" of the military necessities of the situation which led him astray.

The earlier portions of this volume are taken with the discussion of questions such as these, where political, legal, and military considerations have each important bearings on the issues, and concerning them Mr. Ropes speaks with the knowledge and ability of a professional expert. But he shows a remarkable appreciation of strategical problems later on, and justly gives prominence to them in his analysis. For in truth, as we have said already, with officers and troops more or less new to their work, tactics were usually indifferent and but few fields were won by their skilful application. Nowhere is this better illustrated than in the first battle of Bull Run. The Federal strategy was good, and only failed to gain the end it aimed at because the mechanism which it directed was not in proper gear. On the other side a true conception of the situation underlay the schemes of the Southern Generals, but they never were even put to the test because of the miscarriage of an order. The intentions of neither side were therefore really carried out, while the Federals, who had all but effected their purpose in the beginning, were defeated in the end. By the way, we have never seen an unpleasant admission more cleverly veiled in honeyed periphrasis than the tale of their retreat is here. "In spite

of the exertions of McDowell
 in spite of the efforts of the gallant volunteer officers
 the great mass of the men quietly but definitely broke ranks and started
 on their homeward way."

A passage as to the indifference of the Anglo Saxon race to military art and training is well worthy of attention in this country, where we certainly, at anyrate until quite recently, seemed to show much the same apathy as was once noticeable amongst our cousins across the Atlantic. "It was not easy for men in Washington in the winter of 1861 to believe that a hundred thousand men, of their own race, with arms in their hands, animated by a genuine and exalted patriotism, could not without further delay be led to victory by a brave and energetic general . . . The difference between an army and a congeries of volunteer regiments was not appreciated." When a civilian man of business can write thus the chances are that the difference has at length been learnt in America, but it needed such battles as that of the first Bull Run to drive the lesson home. We trust the story of what occurred thirty years ago may be sufficient, without practical illustration, to convince the general public over here. Meanwhile we have little doubt that officers will both enjoy and profit by a study of pages, of which space forbids us more than this inadequate notice, nor need they be guilty of ingratitude if they do so with a sense of favours to come. Members of our Institution at any rate will regard them with particular interest, remembering that last summer the Committee elected their author an honorary member, both on account of what he had already accomplished in the field of military history, and because of an innate love of our profession which gives promise of still greater achievements in the future.

DIARY

OF

LIEUTENANT W. SWABEY, R.H.A., IN THE PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 107, No. 2, Vol. XXII.).)

CHAPTER IV.

*Alarms. Difficulties as to forage. March to the front. Siege of
Ciudad Rodrigo. Return to cantonments.*

26th November.—We were surprised early this morning by an order and route to march immediately to Sabugal, next day to Aldea de Ponte ; through Bombardier Yates mistaking his road it did not arrive till 8 o'clock. We were in harness by 12 o'clock, our road was unluckily through St. Estavão, between which place and Val de Lobo the stony hills are next to impassable, and with all our efforts we could not get up them till 12 o'clock at night, though the distance is not in all 12 miles. It was a fine frosty moonlight night and our work kept us warm, but we were under the absolute necessity of halting and bivouacking under the trees. I got part of the troop into a church, and then walked into the best house I could find, but my baggage was gone to Sabugal and I slept all night in my cloak, nor had we anything to eat since breakfast

27th November.—This morning, without much trouble at the toilet, set at it again, the hills worse than before. Several guns were obliged to be run up by hand as the horses would not face the hills. I was left to bring up the rear, which I succeeded in getting into Sabugal at 7 o'clock a.m., and was excessively glad to get something to eat with Baynes.

I was again left with the rear and got to Soita at about 9 o'clock, having walked most of the distance, and repeatedly put my shoulder to the wheel. We left the two store carts and the currie cart at Sabugal, as Captain Macdonald thought the horses would not be able to get on. I had a miserable billet this night without a door, we put up a board which the wind blew down in the middle of the night, and to my considerable amusement alarmed the Doctor. We ought to, and had the Captain been persevering, might have been at Aldea de Ponte this night

28th November.—Marched at day-break in a hard frost for Aldea de Ponte. Captain M. dispatchod me to Guinaldo, head-quarters, and

four leagues further than Aldea de Ponte, with a letter to Framingham. Though I volunteered for the employment I set out very sulky, because I knew it was useless and informal, as indeed it turned out to be, *O Tempora O mores!* that men will leave their heads in England. I got back to Aldea de Ponte to dinner with Major Downman. At 9 o'clock a route came for our return to Salgueiro. It appears that Marmont¹ indicated intentions of sending provisions under a formidable escort to Ciudad Rodrigo, and Lord Wellington had formed an arrangement to surprise them, but they having intelligence of our movements gave up the design for the present

29th November.—Marched early and got in good time to Sabugal, dined with Baynes. Our horses appear to freshen on their work. Met Captain Wodehouse, of the 50th, to-day going home on his getting his company. I could not help drawing a comparison between us, he went to Marlow the same Board day as I did, and I was earlier in the army.²

30th November.—To-day determined to avoid the descent of those hills that were so terrible to come up. We made a long march to Salgueiro by Meimoa and arrived fresh and in good time. Major Downman, James Macleod,³ and Wodehouse were with us, which turned me out of my bed

1st December.—Blachley dined with our party to-day from Pero Vizeu. I felt chilly and unwell all the evening until when I had been perfectly well

2nd December.—Was so ill with a fever that I did not get up till very late, and was under the charge of Doctor Macdonald.

3rd December.—Being a little better this day got up to dinner, but was under the necessity of making an early retreat to my bed, where I could not sleep, and when I did close my eyes, started in the most alarming manner with some wild dream, generally trying to urge the horses up the hills, and after waking could not tell what I was at for many minutes.

4th December.—Violent fever to-day with the most excruciating pain in my eyes, the Doctor thought it necessary now to be in earnest with me, and gave me powerful soporifics, but I had again no sleep, the same strange dreams as before

5th December.—Somewhat better to-day, but on getting up to dinner was obliged to go to bed again

6th December.—My fever turned into an intermittent one and assailed me violently again to-day, my eyes were so bad that I could not bear the slightest glimpse of light. I passed a restless night, too ill to think, but when the pain in my head abated I could not help sending a longing thought to England

7th December.—This morning I found myself considerably better and continued so all day.

8th December.—Continued better and was up great part of the day.

¹ Duke of Ragusa, after the battle of Wagram in 1809, Marmont received his bâton as Marshal.

² Lieutenant Swabey was promoted 2nd Captain on 24th March, 1825.

³ Lieutenant James A. Macleod (Kane's List, No. 1210), R.A.

9th December.—Got up to breakfast much mended, but still shaken. I believe, however, I have cheated the eagles this time. Wrote to Edwardes¹ and George Smyth. Mr. Crawley, our new Commissary, at our request joined the Mess, viz.: Captain Dyneley, Lieutenants Harding, Newland and Swabey. Dyneley rode over to Pero Vizeu to Major Downman to-day to settle some differences with Captain Macdonald respecting duty. The latter now employs us thus: all subaltern officers at stables from the hours of 6 till half-past 8 o'clock, from 10 till 1, and from 3 till 4, the officer on duty to walk a mile to visit the Park guard. Such orders are useless and oppressive, and coming from an officer who does little himself, and is not over well acquainted with his duty, are scarcely tolerable. Major Downman saw them in this light.

10th December.—This day our patron dined with us. I was up all day, and much better, but take a quantity of bark.

11th December.—Went out to shoot, and killed a partridge, a quail, and a snipe. Rumour of Blake's being defeated, and, as usual, being ignorant of the real state of affairs and the necessity of watching the Tagus, he blames General Hill for not marching to his assistance.

12th December.—Shooting again, killed a couple of woodcocks. We are now put to our wits end about forage, and the villages being all exhausted, we have to look for it in the mountains, where it is so well concealed that it requires much labour to find it, and is a very precarious supply. Blachley dined.

13th December.—General Blake's defeat confirmed. The national enmity of the Portuguese to the Spaniards is so great that when we told the disastrous account to our host and family, they were literally ignorant and malicious enough to rejoice. I really begin to think a knave more desirable in the world than a fool.

This was at the battle of Saguntum, fought on the 25th October, 1811, between the Spanish General Blake and Marshal Suchet. The object was the possession of the city of Valencia on the eastern coast of Spain, as that city could not be invested until the town of Saguntum was taken and the Spanish army defeated. Blake, though superior in numbers and the attacking party, was defeated by the French, with the loss of 1000 men killed and wounded, two generals, 5000 prisoners, and twelve guns taken. Saguntum surrendered the same night. See Napier, Vol. 4, page 287.

14th December.—Shooting again. Killed a rabbit and had the satisfaction to find my new dog excellent. James Macleod dined . . .

15th December.—Letters from England, but I am still left without those consoling little papers. I could not help wishing my friends to take a trip a little while to some foreign land, that they might learn to sympathize in the want of them . . .

16th December.—Poor Frank Chambers so much beat he was quite dispirited, and told me he feared he should die, he is truly very

¹ Lieutenant D. J. Edwardes (Kane's List, No. 1297), "F" Troop, R.H.A.

ill, but I could not help thinking how strikingly the difference between men's dispositions is illustrated in this situation ; despondence and weakness are in him poor fellow almost as prejudicial as illness . . .

17th December.—Shooting again, and killed another woodcock. Blachley dined.

18th December.—Blachley remained with us all day and amused himself with my good shooting!

19th December.—Wrote Henry (No. 8). Letters of late date arrived from England. Reports of an intended change in the administration. I cannot help here remarking how soon the interest people take in politics is lost when they lose the means of being daily informed of the turns they take

20th December.—I found this day as well as many of late so little worthy of being remembered, that I begin to think of curtailing my plan of journal altogether, and am the more tempted to do so from the habits that necessity imposes on us ; for the weather is so cold and there are so few whole panes in the windows, that writing or reading become out of the question, and we have no fires to make sitting still tolerable, so are obliged after dinner to go to bed

21st December.—Went out woodcock shooting, some of the party were successful, but I suppose my shooting days are over, for I could not touch a feather. I now shoot only for exercise, as an amusement it has lost all its charms since last year

22nd December.—Sunday.

23rd December.—Great preparations making for the entertainment of Captain Bull, etc. on Xmas Day.

24th December.—Xmas Eve. Nothing to distinguish this day from the common run.

Xmas Day.—Killed three snipe. Captain Bull did not come over, the rest of the party dined and slept with us. I cannot say I enjoyed my Christmas dinner, nor are these parties at all suited to my taste. This is only the second time in my life that I have been absent from our family party on this day, last year I felt more satisfaction in being so than I do this.

26th December.—Went with Stanhope,¹ etc. to show them the game in the country ; very little sport. They dined with us and our evening went off with as little pleasure as before

27th December.—Our visitors left us for Pero Vizeu. Letters from head-quarters speak of Lord Wellington's intention of besieging Ciudad Rodrigo. The weather does not promise to make it a very agreeable business, the snow on the top of the Estrella is a forerunner of a cold season.

The Engineers have orders to prepare gabions and fascines, etc., this looks like earnest ; but if Lord W. means it for a feint, to make the deception answer, preparations must be carried on, and he must be the only man in the army undeceived. The French it is

¹ Lieutenant Philip Stanhope (Kane's List, No. 1159), "I" Troop, R.H.A.

now evident cannot support their armies on the frontier of Portugal, nor do I think our means of transport for provisions will enable us to advance, and to live on the country would be more difficult to us than to the French, for the Spaniards will not advance an inch of supply without payment in specie.

28th December.—Harding and Captain Macdonald went to Pena Macor to pay their respects to General Alten, he has not yet done himself the honour of requesting this homage from me.

29th December.—Captain Bull and Blachley came over and I was persuaded to ride to Pero Vizeu with them, being rather late, Dr. Wooldridge¹ who was of the party, and I, not being able to ride so fast as the others on account of the bad condition of our horses, were left behind. I had never travelled this road before, and he, like many others, had gone over it with his eyes shut. In this predicament darkness overtook us, and after certain perambulations on the mountains we came to a village. Not a soul nor an inhabited house could we find for some time, till at last I dismounted with my gun in my hand and discovered a light. On entering the *casa* two men were sitting there who, as usual, declared that they did not know their way to Pero Vizeu, though I was sure we were within at least three miles of it. As I have had to do with these gents before, I asked no further questions, but turned the youngest out by the collar and obliged him to go with us, though he declared all the time he did not know the way; he contrived however to take us by a short road, and having been obliged to use him rather roughly, I dismissed him before we got to our destination with some *vintens*,² which put him in a good humour. Church bells and guns firing were commenced from the town to tell us where we were, for it is very easy in these mountains to wander all night close to the place you wish to get into without finding exactly where it is. We were late for dinner of course, but glad enough to get any at all

30th December.—A bad shooting day with Ramsay³ and Stanhope.

¹ Assistant Surgeon John Wooldridge (Kane's List, No. 145).

² A small Portuguese coin worth $1\frac{7}{10}$ d.—*F.A.W.*

³ 2nd Captain William Norman Ramsay (Kane's List, No. 1019) served throughout the campaigns in Holland, 1793-4, and Egypt, 1800-1.

In 1809, he accompanied "I" Troop to the Peninsula, and served with much distinction in the campaigns of 1811, 12 and 13, being on various occasions in command during the absence of Captain Bull owing to wounds.

On the morning of the battle of Fuente de Honor, when on picket with two guns, he was cut off by a rapid advance of the French cavalry, but in a very dashing and brilliant manner galloped through them and escaped. For many years it has been believed that this exploit was performed by the whole troop, but the contemporary evidence of Lieutenant Ingleby, R.A., who was present at the battle (*see* his diary, p. 247, R.A.I. "Proceedings," May 1893), and the "Diary of a Cavalry Officer," p. 100, as well as an account of the affair given in R.A.I. "Proceedings," Vol. XIX., No. 12, clearly prove but two guns were concerned. It may also be noted that the French General Marbot, who was a cavalry officer, and in his memoirs gives a long and very detailed account of the battle, makes no mention of the affair, which is improbable had the French cavalry but for the moment cut off a whole troop of Horse Artillery. The mistake probably has arisen from Colonel Napier's version of the affair. Vol. III., p. 513.

The day after the battle of Vitoria, Ramsay had the misfortune to incur the displeasure of Lord Wellington (particulars hereafter). He served subsequently with distinction at Nivelle, Nive, before St. Jean de Luz, and the operations near Bayonne.

Major Ramsay when in command of "H" Troop met a soldier's death at Waterloo, universally regretted.—*F.A.W.*

Pero Vizeu stands under a precipice near the summit of a perpendicular mountain, and is little calculated to contain cavalry, at least not more than two troops of dragoons should be quartered there: forage is to be had, but at a considerable distance

31st December.—An equally bad party with the gun.

1st January, 1812.—Was again employed as yesterday, my dog "Rough" has had so much to do lately in this way, that to-day he fairly gave in, and I was obliged to carry him home at least two miles, when so tired that my own weight would have been quite sufficient. All our troop dined with Bull to-day. Colonel Elley,¹ Deputy-Adjutant-General of the 1st division of cavalry was of the party; he is a highly entertaining and intelligent character. A letter I saw from an English officer at Cadiz spoke highly of the deserved reputation of the Spanish General Ballesteros, and of his two late well-earned pieces of success. The weakness of the Cortes and its bad and inefficient administration has been lately conspicuous in their House of Assembly. It was surrounded by a mob demanding the head of an unpopular member. He was saved with great difficulty by some of the more popular ones engaging to bring him to trial. One member, a priest, hearing his own name mentioned by the populace fainted with fear, so much has superstition and an oppressive government weakened the minds of men. Ballesteros supports his army and plans his operations entirely independently of the Cortes. As he is said to have influence and power enough, it is much to be wished that he would establish a new government on a better basis, or at least improve it by diminishing the numbers of the Executive.

"In the autumn of 1811, General Ballesteros, by adopting a system of warfare similar to that of the Guerrillas, manœuvred in the south of Andalusia with much success against various French detachments; supported by Gibraltar and the strong country of the Ronda, the inhabitants of which were ever in arms. He appeared so formidable, that Soult deemed it necessary to send a division of 8,000 or 10,000 men against him. Ballesteros long avoided a general action by rapid marches; at last on the 14th October, being driven to the very extremity of the Peninsula, he took refuge, and found security and support under the guns of the British fortress. To support his operations a detachment of British and Spanish troops were sent to occupy Tarifa. Godinot at once turned his attention to dislodging the invaders, but failed and retired, Ballesteros in his turn became the assailant and gained considerable advan-

¹ Colonel John Elley: this distinguished officer entered the army as a private soldier and rose by his own merit. He served in the Coruña campaign and was present at the actions of Sahagun and Benevente. He afterwards served under Lord Wellington in Spain, and was employed on the staff from 1807 to 1819, when he returned to and commanded his old regiment the Horse Guards. He commanded the rear-guard of cavalry at Talavera, was present at the battles of Fuentes de Honor, Salamanca (wounded), Vitoria, Orthes and Toulouse.

At the battle of Waterloo he was severely wounded. For his services he was made a K.C.B., K.C.H., K.M.T., and received the gold cross and three clasps. He was Colonel-in-Chief of the 17th Lancers; he represented Windsor in Parliament in Sir Robert Peel's government. Lieut.-General Sir John Elley died 23rd January, 1839; leaving large bequests to charities; also money to provide plate for the 7th Hussars and 17th Lancers.

tages over Godinot in his retreat. The French however had no idea of leaving Tarifa in possession of the allies, accordingly General Laval with 10,000 men invested it on 20th December, and assaulted it on the 31st, but failed. Colonel Skerrett made such skilful arrangement by forming interior retrenchments, that the French fearing a second repulse retired on the night of the 4th of January, 1812." "War in Spain and Portugal." J. T. Jones, p. 192.

The English and Spaniards at Tarifa, commanded by a Spanish officer, are justly condemned for not sufficiently assisting Ballesteros. I cannot help wishing that we invariably refused to commit our troops to the orders of Spaniards,¹ but I suppose it is necessary to humour them, notwithstanding we suffered at Barossa by this system.

The failure of the Spanish General to support his ally at the battle of Barrosa is referred to, it was thus :

"In the spring of 1811, it was resolved to make an offensive movement to destroy the French works in front of the island of Leon at Cadiz. With this object a force of 12,000 Spanish, and 5000 English troops under General La Pina, General Graham consenting to act under his orders, was formed at Tarifa. From whence they marched along the coast on the flank of the French to join the remainder of the garrison of Cadiz that was to cross by a bridge thrown across the San Pedro river, which separated the island of Leon from the main land. On the 4th of March the combined force from Tarifa reached Vejer, where it was planned that the Spaniards leading should march on Conil, and the English following should there unite with them at night and attack the French next day. On the march, General Graham, in compliance with an order from La Pina, while moving from the heights of Barossa to those of Bermesa to join his ally, discovered on his right flank a French corps of about 8000 men under Marshal Victor. Aware that if he continued his march the enemy might attack him to the greatest advantage, General Graham decided to become the assailant, and after a most severe action of one and-a-half hours defeated the French with the loss of 3000 men, six guns and an eagle. Although within three miles and in sight of the battle, La Pina made no attempt to assist his ally, and in consequence, General Graham, feeling he could have no confidence in acting under a superior who had exposed the British division to the hazard of destruction, withdrew from his command, and retired with his force into the island of Leon, and each army resumed its former attitude." (See "War in Spain and Portugal." J. T. Jones, p. 181, *et seq.*

¹ "To induce the Spaniards heartily to co-operate with the British and Portuguese, Lord Wellington, in 1811, proposed that whenever the troops of the three nations should act together, the officer having superior rank should command." "War in Spain and Portugal." J. T. Jones, p. 163.

Colonel Elley, as well as the newspapers, might be unacquainted with one of Bonaparte's artifices not at all uncongenial to the French system of warfare in Spain and this country.

Certain districts are given up from whence King Joseph supplies his finances, these are of course where the army has the means of enforcing the collection of his revenue, which is generally levied in corn and other articles of subsistence for troops. The unfortunate Spaniards are then obliged to re-purchase their own produce as means of support, when they have done so, Marmont again seizes on their property as a supply for his troops. This ruinous and perfidious conduct needs no comment.

2nd January.—This morning the mountains and valleys were covered with snow which continued to fall most plentifully. I had to go back however to Salgueiro not in a very good humour. I got there well drenched at 5 o'clock, being unable to ride out of a walk, which indeed was very fortunate in one respect, for my unfortunate mare was so ill that she could go no faster. During my absence Brigadier-General Borthwick, our new commandant, had passed a night at our quarter on his way to the front. As an instance showing how highly such appendages are estimated: When he landed at Lisbon he wrote to Lord Wellington to announce his arrival, but Lord W. I suppose thought it too much condescension to answer his letter, for the post seldom miscarries in this country.

Our Brigadier-General had insolence enough to turn my horses out of the stable to make room for his cattle, an unnecessary proof of his superior rank, which had I been at home would not have gone unremarked

3rd January.—A miserable snowy day, too cold to sit still and too wet to go out, the last alternative I found the best. A mail from England bringing me no letters

4th January.—What is called the wet season regularly set in with a vengeance, our horses up to their knees nearly in the water, little to eat and much less inclined. Twenty new ones joined from Coimbra. One stable fell in altogether, fortunately no damage done. The men had a fine opportunity of learning to swim in their quarters to-day. Last night we had a pretty specimen of Portuguese presence of mind, the house was on fire and nothing but wringing of hands and cries of *fogo em casa* were exercised to prevent its being destroyed; fortunately our cook and servants were in the way and we stopped its progress without much damage being done

5th January.—Another terribly wet day. Major Downman and Macleod came over on their way to head-quarters. Colonel Framingham and Pascoe arrived unexpectedly on their way to the Alemtejo, likewise Colonel Elley, Ramsay, and Stanhope on a shooting excursion, so that where we used to sleep two and three in a room, now we are six, there being no other accommodation in the town. I took refuge in the commissary's quarters; it rained much in the night, and the roof only being tiled I was awakened and found the water dropping on my bed. A tarpaulin spread over all soon sent me to sleep again

6th January.—Colonel Framingham, etc. still with us. I being on duty had little to do with the cock shooting.

On this night, having previously reconnoitred and invested Ciudad Rodrigo, Lord W. caused a fort 400 yards from the place to be stormed by two companies of the 95th, two of the 43rd, and two of the 52nd, by whom it was carried in a most gallant manner, and with little loss, not more than 150 killed and wounded. Things seem now to wear a fighting aspect.

This was the redoubt of Francisco, it was stormed by Lieut.-Colonel Colborne¹ with two companies of each of the British regiments forming the light division. "This he did with such fury, that the assailants appeared to be at one and the same time, in the ditch, mounting the parapet, fighting on top of the parapet, and forcing the gorge of the redoubt, where the explosion of one of the French shells had burst the gate open. Of the defenders a few were killed, not many, and the remainder, about 40 in number, were made prisoners. The post was thus taken with the loss of 24 officers and men." Napier, Vol. IV., pp. 377-8.

7th January.—An order arrived permitting the removal of the troop to better foraging quarters, the selection being left to ourselves . . .

8th January.—Set off with the commissary to range the Sierra d'Estrella in pursuit of a suitable foraging district. The first adventure was the mule that Sutton rode giving him the slip and escaping entirely from us, which occasioned our being so late that we only got to Belmonte, a place I have seen before. Our billet was at a priest's and given us as a great favour by the "Just," whom we knew, but of all the cold places I ever was in this is the worst. The night was frosty and we got in so late that our fare was but indifferent, consisting of a tough beef-steak we brought with us, and we had much difficulty in getting bread to eat with it. It is always necessary to carry rations in this country as there is no meat to be purchased. Very little, except sometimes pork, is eaten, probably this was not the case before the oppression they at present labour under, but I believe they never knew what comfort was.

9th January.—Rose with the lark this morning, too cold however for his notes; crossed the Zezere, the most rapid river I have seen yet, and being directed to Famalicão by Major Downman, took the only road to it through Avilas in a ravine of the Estrella where runs a branch of the river. It is a tolerable town but the inhabitants so lazy that they do not even carry the forage from the fields but stack it in small bundles exposed to the rain. We found even at this distance, four leagues, that the Hussars, who are the most industrious foragers, had been from Covilhão. The snow lies constantly so deep during the winter months on these mountains that we found the road to Famalicão inaccessible for artillery, and indeed difficult for our horses, which we

¹ Afterwards Field-Marshal Lord Seaton, the distinguished Colonel of the 52nd Regiment, which Napier described, "As unsurpassed in arms since arms were borne by men."—*F.A.W.*

were obliged to lead. Finding no signs of forage in the town, and having visited a convent whose fair inhabitants had fled the insolence of the invaders, and is now only tenanted by an old priest whose appearance and sanctity well answers all the descriptions we find in romance, we undertook, though dissuaded by the people, to go to Gonzalo over the mountains. The snow soon covered the track, for it was nothing more, and Crawley and myself having previously dismissed a corporal and two men who were of the party, were left to our wits; but as we were pretty certain of the points of the compass, after two hours hard labour, our horses being led all the while, we reached that place which looks over the valley of the Zezere.

This is a fertile and highly advantageous foraging district, but excepted in my instructions as being destined to be occupied by Captain Bull. We went from there to Avala and Seche Moulla and returned just before dark to Aldeia de Moite where Sutton, who had been despatched in the morning, had prepared an excellent repast, viz.: *soupe* and *bouilli* and *bouilli* and *soupe*. We had a good billet and were well housed, but at about 12 o'clock I was wakened by the clash of swords in the street and lost no time in finding some of my men who were pursued and outnumbered by the Portuguese; my interference was fortunate, though being undressed and unknown it cost me a few stones at my head. The men being in the wrong were confined. A sword was lost but during the night it was thrust by a Portuguese into a door where they were billeted. This day I wrote to Brigade-Major May requesting to be employed at Rodrigo

10th January.—Returned through Caria to Salgueiro, passing over two bridges that had been carried away last year by the water in the rainy season; the report of my excursion was unfavourable to a move.

11th January.—Passed all day at Salgueiro. Major Downman and his adjutant still with us

12th January.—At 1 o'clock last night came a route to move up to the front halting at any place on our side of Sabugal. We fixed unluckily on Castaneros, distant only two short leagues. The road was rocky and difficult. We marched at 9 o'clock leaving our store carts behind, I remained on the road with the wheel car till 9 o'clock at night, when it became so dark that I left a guard with it and got to Castaneros where we all were without baggage, our servants having reached another village where the troop was intended to halt. I got a beef-steak, and being in this instance lucky enough to find a chimney, we made a large wood fire and slept in our cloaks before it

13th January.—The road if possible worse to-day than yesterday. I did not get to Sabugal with the wheel car till dark, and being left to my discretion and not knowing how far we might march the next day, I demolished several spare shafts and perches and ordered it to proceed in the morning. I then set off without a guide to get to Quadrazaes following the track of the wheels. To do this I was obliged to walk and lead my horse, there being unluckily no moon, I crossed the track where Bull had marched the same day and arrived at the wrong town

at 9 o'clock. I missed my baggage terribly this night for I never was in such a cold billet, nothing but tiles overhead and no fire or bed. The people in this country appear to me only to build in the summer time, at least if I can judge from the attention paid to thorough draughts and a free circulation of air

14th January.—Luckily found my place of destination, Quadrazaes, was only four miles off, and I reached it early, found myself in a house formerly occupied by the Commander-in-Chief, but cannot boast of the accommodation. We were fortunate enough to find two days forage, a rare thing in these parts. This morning the firing at Ciudad Rodrigo was to be heard in all directions

15th January.—The batteries opened on Ciudad this night, and a heavy fire was kept up.

[The siege of Ciudad Rodrigo was undertaken very late in this season, of course with our light part of the service we were in the covering corps. I think it was during this time, the snow falling occasionally, that the wolves came down so thick at night from the wild mountains that the sentries over our guns applied to be doubled. I remember well that I superintended the shooting of a horse as I went to dinner about 6 o'clock, and passing by the camp about an hour afterwards there was not a remnant of him, except his bones to be seen!]

The arm of the service to which I belonged was then commanded by a gallant old gentleman,¹ rather corpulent indeed, but of an indomitable spirit. When the relief from the trenches and batteries takes place, as all frequenters of such places can testify, the party relieved run off as fast as they can to get under cover; this gallant old veteran, however, neither could nor would run, so there he strode along in all his glory with shot and shell, musket and rifle, blazing at him, which occasioned Lord Wellington to designate him "the walking target." Whilst those engaged in the trenches employed themselves in shooting at nobler game, I employed my leisure hours and my trusty "Joe Manton" in supplying the table with woodcock and snipe.

Cazilhas de Flores was the name of the village which we occupied. How poetical are the names of Spanish and Portuguese villages, Cazilhas de Flores, cottages of flowers, how can it be named without the expectation that some fair nymph, emulous of Flora herself, must rise up from behind every bush and shrub. Then close to this elysium we have Arroyo de Molinos, the mill brook, here too must be the enviable locality which is gladdened by the presence of the maid of the mill. I have been happy enough likewise to tread the ground where is especially evidenced the natural taste of the inhabitants, somewhat, it is true, obscured by the fumes of garlic and bucellas, but that is the fault of their training and not of their nature].

16th January.—We received a letter from Major Downman to say that Dyneley was permitted to be employed in the batteries, and that half-an-hour after entering them his head was broke by a splinter;

¹ Brigadier-General William Borthwick (Kane's List, No. 552), he was wounded in the siege and returned to England.

that General Borthwick, May, Dundas¹ and Holcombe² were all bruised by the explosion of shells. Dyneley's hurt was not sufficient to prevent his services, he had it dressed and returned again to the charge.

17th January.—Went out to shoot but met with no encouragement. The wind changing we very much apprehended that the frost would take its departure and increase the difficulty of the siege.

18th January.—Moore³ from Soita dined with us. Harding and the Captain set off on their travels to take a distant view of the batteries. The evening passed with me but heavily.

19th January.—This night at 7 o'clock there being two practicable breaches, the larger one of sufficient size to admit a company abreast, Lord Wellington ordered Ciudad to be stormed. I have as yet got no further particulars than that the 3rd division attacked by escalade whilst the light division went in at the breach. The enemy made a desperate resistance. I have as yet only heard that General Robert Craufurd was badly wounded, General Mackinnon blown up so that not an atom of him could be found to identify. General Vandeleur and Colonel Colborne were wounded, and Major Napier, 52nd, lost an arm, the forlorn hope was led by Lieutenant Gurwood, 52nd, to whom Lord W. presented the Governor's sword. When driven from the ramparts the French retreated to the square, planting their field pieces down the streets.

20th January.—Lieutenant Stanhope dined with us, of course full of our success

21st January.—Went out shooting.

22nd January.—This day 1300 French, of whom 60 were officers, passed under an escort of a regiment of Caçadores for Lisbon; through them we learnt that Ciudad was plundered during the whole of the 20th by the troops. Never were there such wretched objects as these men, nothing in their possession but the clothes on their backs, shockingly emaciated, probably from the fatigues they had undergone in the batteries; except the artillery, by no means a fair specimen of the French troops.⁴

¹ Captain William Boulden Dundas (Kane's List, No. 1150) served at the siege of Flushing in 1809, and the following year joined the army in the Peninsula at Cadiz. At Ciudad Rodrigo he was wounded in the right ankle, and afterwards at Badajos lost his left arm. Captain McCarthy, in his recollections of the siege, says:—"Soon after I met some more artillerymen conveying in a blanket from the same battery an artillery officer, Captain Dundas, very severely wounded, he was a heavy man, and his left arm dreadfully shattered, his shirt and coat torn to rags, his arm was bent and hung over the side, and the weight of his body swagged to the ground. I stopped to assist in putting him in a better position, and laid his left arm straight by his side; his left thigh and leg were also injured."

For his Peninsular services Captain Dundas was made a C.B. In 1839, he was Inspector of Artillery, (Gun Factories) and he died a Major-General in August, 1858.

² Captain Harcourt Fort Holcombe (Kane's List, No. 895) served in the Coruña campaign. In 1811, he again joined the army in the Peninsula, and served at the sieges of Ciudad Rodrigo and Badajos; after the fall of the latter place he joined the army on the east coast of Spain, and was present at the siege of Tarragona and the battle of Castella. He received the C.B. Lieut.-Colonel Holcombe died 6th March, 1847.

³ Lieutenant George A. Moore (Kane's List, No. 1410), R.A. He was killed at the passage of the Gave de Meulon in the south of France on 15th February, 1814.

⁴ "The garrison consisted of one weak regiment of French infantry, one German, one Italian; the last as strong as the other two. The artillery, two companies, were the only good part of the whole, and did all they could to prolong its defence." "Cavalry Officer's Diary," p. 124.

The escort marched them all like a flock of sheep into the church at Sabugal. One could not help pitying their situation ; as a specimen, one officer of Engineers was stripped of his boots and obliged to walk all the way to Lisbon barefooted. Their cruelty to the Portuguese, and in this instance, their having totally ruined the place, can alone justify their being robbed. It is singular that many of them that had even their coats torn from their backs had money.

The sick and wounded, making the whole amount up to 1600, have gone by another route. The garrison, at the period of our investing it, consisted of 2000 men. A courier passed for head-quarters, said to have despatches announcing some signal success of General Hill's, reports go so far as to say that he has taken Badajos

23rd January.—Heard further particulars of the events of the siege, by which it appears that there were two breaches ; the main one was stormed by the light and 3rd division, the 4th stormed the small one, and some regiments entered by escalade. The resistance was not very determined, and only at the large breach. The stormers had each a sack of grass to throw into the ditch to break their fall. The most resolute opponents were some deserters from the 52nd and 43rd, 40 rascals in all were found in the place, one villain stood in the breach calling for Lord Wellington. Our troops, as soon as the breach was gained, more eager for plunder than their duty, broke and ran, in defiance of their officers, for plunder and committed shameful excesses, disgraceful to the whole army, not a soul that was not rifled, and the dead were scarcely cold when they were inhumanly stripped. Let me say something for the English character : no intentional murders were committed, though some of the men were so drunk that they fired promiscuously in the streets and killed many of their comrades¹ The Governor,² instead of defending his charge and setting an honourable example by being forward in the breach, was taken by Lieutenant Gurwood eating his dinner. The same officer led the forlorn hope, and Lord Wellington presented him with the Governor's sword. The latter had the impudence to ask Lord Wellington if he had not made a noble defence ; Lord W. bowed in silence. The Governor complained that it was contrary to the usage of war not to have summoned the place before storming it, and went so far as to talk in a very contemptuous manner of the Spaniards, till Lord Wellington was obliged to silence him. As he was sent down to Lisbon without horses or attendance, certainly no very honourable opinion was entertained of his defence. I fear, likewise, that it was an understood thing between Lord Wellington and Don Carlos d'España that the place was to be plundered on account of the perfidy of the inhabitants who favoured the French. The Governor's papers brought much in this way to light, and a correspondence of Marmont's at

¹ The same characteristic is recorded of the soldiers at Badajos. "Nor did the great loss the troops sustained from the well prepared efforts of their antagonists render them vindictive ; on gaining the ascendancy not a Frenchman implored mercy in vain. Scenes of plunder and drunkenness, such as are inseparable from an assault prevailed to a great extent, but strong measures were immediately adopted to restore order." "War in Spain and Portugal." J. T. Jones, p. 239.

² "Baron Barrier, General de Brigade.

Almeida was by this means discovered. Next morning 14 Spaniards, all men of respectability, were hung

24th January.—Dyneley returned with Harding this day from headquarters, his wound proves to be a mere scratch

25th January.—Heard complaints of our soldiers at Rodrigo; their conduct appears to have been highly licentious.

The works are being restored and the 5th division holds the place till it is fit to give up to the Spaniards.

“The duration of the siege was twelve days, or half the time originally calculated upon by Lord Wellington. The manner in which he assaulted the place before the fire of the defence had been in any way lessened, and before the counterscarp had been blown in, were the true causes of its sudden fall. Both the military and political state of affairs warranted this neglect of rules. The assault was confined to the 3rd and light divisions. The great breach was cut off from the town by a perpendicular descent of 16 feet, and the bottom was planted with sharp spikes, and strewn with live shell; the houses behind were all loop-holed and garnished with musketeers, and on the flanks there were cuts, not indeed very deep or wide, and the French had left the temporary bridges over them, but behind were parapets so powerfully defended that it was said that the 3rd division could never have carried them had not the light division from the smaller breach taken the enemy in flank. The French fought bravely in the breach and by their side many British deserters, desperate men, were bayoneted. The French lost 300 men, and 1500 prisoners were taken. The loss of the allies was 2 generals, 90 officers and about 1200 men.”

“The excesses committed by the allied troops were very disgraceful, throwing off all the restraints of discipline the soldiers were not to be controlled. The town was fired in three or four places, the men menaced their officers, and shot each other; many were killed in the market-place, intoxication soon increased the tumult, disorder everywhere prevailed, and at last the fury rising to absolute madness, a fire was wilfully lighted in the middle of the great magazine, when the town and all in it would have been blown to atoms, but for the energetic courage of some officers, and a few soldiers who still preserved their senses.¹ The Spanish people were allies and

¹ Captain William Jones (Jack Jones of Busaco celebrity) made himself remarkable immediately after the assault of Ciudad Rodrigo. A French officer having surrendered to Jones, Jack made use of him somewhat as Valentine is represented to have used Orson—to show quarters for his men—and having placed some of them in a large store, the French officer led the way into the church, in front of which Lord Wellington and some of the staff were collected. Some fire had been lighted already (supposed by Portuguese soldiers) on the pavement, and the Frenchman entering and seeing the fire, instantly started back, exclaiming ‘Sacr   bleu!’ and ran out with looks of utmost horror. Jones not understanding French did not catch the idea: ‘Sacr   bleu’ puzzled him, until going further in, he saw powder about the floor and powder barrels near the fire. ‘Sacr   bleu’ became at once identified with powder, and he immediately got the help of two or three of his men (whose names are not known), and carried with his own hands the powder barrels out of the way of immediate danger. This deed passed unrequited at the time: let the memory of it now receive our admiration.” Extract from Record of 52nd Light Infantry.

friends, unarmed and helpless, yet all these claims were disregarded."

"Many of the inhabitants were emissaries of the enemy: all these people Carlos d'España slew without mercy, but of the English deserters who were taken, some were executed, some pardoned." Napier, Vol. IV., p. 386, *et seq.*

26th January.—Last night an order to have a day's provisions and three days' bread delivered to the men and a route to Cazilhas de Flores was received. We marched at 9 o'clock and arrived at our destination at half-past 3 o'clock.

[It was very much the custom amongst the simple villagers to bring us their sons at the age of from 15 to 17, begging us to take them as servants, and most useful and intelligent these lads were after a little training; famous foragers and efficient interpreters. It is to be observed that there was generally a deadly feud between the Spanish and Portuguese lads of this sort. It was at Cazilhas de Flores that one of these was brought to me by his mother, and faithfully and well did he serve me, but he was never destined any more to be folded in the arms and pressed to the bosom of this tender parent. He was superior in hardihood to most boys, very handsome, and devoted to me as to a father. He lost his life one day in a bivouac; one of my horses with saddle and furniture on fancied he would roll, the boy to prevent injury to the saddle imprudently struck him, and again as he rose, when lashing out with both hind legs, the horse struck poor Manuel on the forehead and he never spoke again. As I never returned to the land from whence he came, I had not the means of informing his mother of his fate.

I resolved that as this had been the first so it should be the last boy that I protected, but it was not so destined, for a Spanish lad attached himself to me in a cantonment, and though I declined all engagement, I found him one day with my baggage mules, where he would remain. In the retreat from Salamanca he too perished, more naturally indeed than the other, for he was worn out by ague and fatigue, and his bones were left on the road not far from Ciudad Rodrigo, and viewed perhaps by the French with as much indifference as their remains would have been by us].

27th January.—Captain Macdonald joined us at Cazilhas de Flores to-day. The reports of the cause of our move are that the French have appeared in force in front of Salamanca.

28th January.—We learnt to-day that Marmont was so much in want of intelligence concerning Rodrigo that the cause of his appearance was actually to endeavour to throw into it 200 car loads of supplies, and the first he knew of its being taken was on his advanced parties' reconnoitring the light division; he has now retired.

29th January.—General Craufurd is dead of his wound. As an example of the thoughtlessness of soldiers, one was fortunate enough to find in Rodrigo £300 in dollars and employed it in treating the company he belongs to with a skin of wine every day as long as it lasted. I should here explain that instead of casks the Spaniards and Portuguese sew the skin of a pig together and keep their liquor in it.

30th January.—The frost gone and a most disagreeable wet day ; in this country the most unpleasant of all calamities. Received a route for Caria there to wait for orders as to where we are to be cantoned. The Agueda is so swelled that the orderly bringing the order was obliged to swim the river.

31st January.—Marched at 9 o'clock to Aldea de Ponte and arrived there late, it having rained in torrents the whole time ; by keeping a fire in the quarters all night we were enabled to get our things tolerably dry. The cause of our moving from Quadrazaes to Cazilhas de Flores appears to have been that Marmont had shewn himself in front of Salamanca with 200 cars laden with supplies for Ciudad Rodrigo, so ignorant was he of the real state of affairs, and even of the fall of that place.

1st February.—Marched late into Sabugal. A terribly wet day, the waters were so much out that at Alfayates the river was so rapid that it carried one of our men away, horse and all, and it was not without considerable exertion that he was saved by catching hold of him from the bank when he was nearly exhausted and had been carried a great way down the stream.

We found Sir Stapleton Cotton¹ and staff at Sabugal, and understood that we were removed from the 7th division and attached to General Le Marchant's brigade of the 1st division of cavalry

2nd February.—Rain all day, we found we were intended to march to Gonzalo, halting a night at Asingias, at which place however, finding Captain Bull's troop halted, and unable to pass the river to Belmonte we proceeded to Caria, leaving our guns at Valverde ; the guard over them passed the whole night in the open with incessant rain. Last night Gunner Smalley, bearing orders to Captain Bull, gallantly swam the river Caria, though it was running with inconceivable rapidity, and not finding him as expected at Belmonte, re-crossed to Asingias in the same manner

3rd February.—Rained all day, we were employed in searching the very boxes of the inhabitants for forage, very little of which could be found

4th February.—A wet day. Wrote to Mr. Walcott.²

5th February.—Incessant rain. Fortunately our houses are very good, Caria being on the whole the best built and most opulent town for its size I have seen in Portugal. It has been so often occupied by cavalry that little forage is left in it at this season of the year . . .

6th February.—Received orders to march to Belmonte instead of Gonzalo, and the rain having abated, I was able to pass the Caria, and got there ready to arrange for the arrival of the troop. I went to my own billet where the Prior and the ladies very courteously gave me wine and pork chops for supper, having killed a pig in the morning. It should be noticed that these Portuguese ladies, for the sake of warmth, pass all their time in a smoky kitchen without a chimney, the fire-place

¹ Afterward Field-Marshal Viscount Combermere.

² Mr. Walcott was a country gentleman living near Christchurch. From his constant and favourite expression, "Don't ye know," he was so called among the officers there.—*F.A.W.*

in the room consisting merely of a paved excavation, two upright stones against the wall forming the grate. How it would surprise them to see a baron of beef turned by a smoke-jack !

7th February.—The troop marched into Belmonte. The stabling bad, and our quarters for stationary ones indifferent

8th February.—Went to examine the ruined castle at this place, but am not antiquary or architect enough to judge of the date of its building, and there is very little to be learnt from the traditionary tales of these indolent people, even the priest could give us no other account than that it was "*muito antigo*." There is on only one stone an inscription, which is too much defaced to give any information, conjecture is the only ground for my thinking it to have been in part Moorish. There is a Roman Catholic chapel, but it is apparently of later date than the rest of the building. In this chapel many skeletons were dug up by the French, who expected to find the riches of Belmonte reposing with the ashes of its fathers. How far they succeeded I did not hear, but there is an inhabitant who, when the French were here fled like the rest to the mountains, previously burying his riches ; but when there, he found himself so uneasy without them, that every night in the dark he used to visit the place of their entombment to see if his darling dollars were safe.

9th February.—Principally employed in foraging. By sending across the Zezere to Aldea de Mato we find much hay. This is the same town where I was unable before to obtain an atom of forage. This proves that much is concealed in the mountains ; our late move on Ciudad was I suppose the cause of its returning to the town

10th February.—The centre and left divisions were sent to remain at Aldea de Mato with a view of recruiting the horses with the good forage. The cavalry brigade we are attached to consists of the 3rd and 4th Dragoons and 5th Dragoon Guards

11th February.—Rode to Aldea de Mato to see my division. Much hay had been found concealed in the houses in all the odd holes that can be imagined. Captain Ramsay dined, and Mr. Bridges of the Royals on his way from England to join General Slade as aide-de-camp.

12th February.—Went shooting without success

13th February.—Went to Gonzalo and dined and slept at Captain Ramsay's

14th February.—Shot with Ramsay.

15th February.—A report received *viâ* head-quarters that General Lacy and the Spaniards had surprised the French in Tarragona, killing 2000 men, taking many prisoners, and possessing themselves of the place.¹

The 1st division marched through Caria for Abrantes to-day, which is doubtless a preparatory movement to the siege of Badajoz.

"Ciudad Rodrigo being taken, Wellington's eyes were now turned towards Badajoz, which he was desirous to invest in the second week of March ; because then the flooding of the rivers in

¹ This report was incorrect.—*F.A.W.*

Beira would enable him to carry nearly all his forces to the Alemtejo without risk, and the same rains would impede the junction of the enemy's force in Estremadura. Green forage was to be had in the last province considerably earlier than on the Agueda, and the success of the contemplated campaign in Andalusia depended upon the operations taking place before the harvest upon the ground should ripen, which was the enemy's resource, and would happen much earlier than in Leon. Having made his arrangements, Wellington set off for Elvas which he reached on the 11th March, but owing to the vexatious delays of the Portuguese Regency causing the the absence of the necessary transport, the investment was put off till the 17th." Napier, Vol. IV., p. 392, *et seq.*

16th February.—Returned to Belmonte, crossing the Zezere, which is everywhere to be forded, unless after heavy rain.

17th February.—Went by invitation of Sir Stapleton Cotton to a ball given by him at Covilhão, which passed off well enough; the want of politeness in the manners of the Portuguese ladies, as might be expected, was more striking here than at Lisbon.

There was a supper, consisting of as many good things as the country affords, but few elegancies. The ladies and gentlemen, notwithstanding the solemnity of the fast of Lent, eat ham, etc. to an extent scarcely credible. Some at first were staggered, but only waited for someone else to begin to set Lent at defiance, and I really think from their performance that till then they had been good Catholics.

The ladies did not admire country dances, there was some waltzing by two Portuguese officers. N.B.—Cannot boast of the beauty of my partners. I dined with Major Downman and slept at Colonel Elley's.

18th February.—Employed this morning in shopping. Cloth is manufactured here, tolerably good, and sold at about 12s. a yard. English manufacture is also to be purchased, this is one of the best markets for English quarter-masters. Breakfasted at Colonel Elley's. We returned to Belmonte. Captains Bull, Macdonald, and Ramsay dined with me.

19th February.—Rode to witness the improvement of my horses at Aldea de Mato.

20th February.—Lieutenant Blachley dined and slept. N.B.—Bombardier King promoted Corporal.

21st February.—Being overpersuaded I went to dine at Gonzalo with Lieutenant Moore; glad to get to bed and tired of the party.

22nd February.—Set off home early, having been visiting so much lately and enjoying myself but little. Found Major Downman, etc., and an order to leave Belmonte to make room for the 6th division who are expected to march through, this made me rather sulky.

23rd February.—Took up my quarters at Aldea de Mato at an indifferent *casa*. Received letters from home dated 19th and 27th January.

(To be Continued).

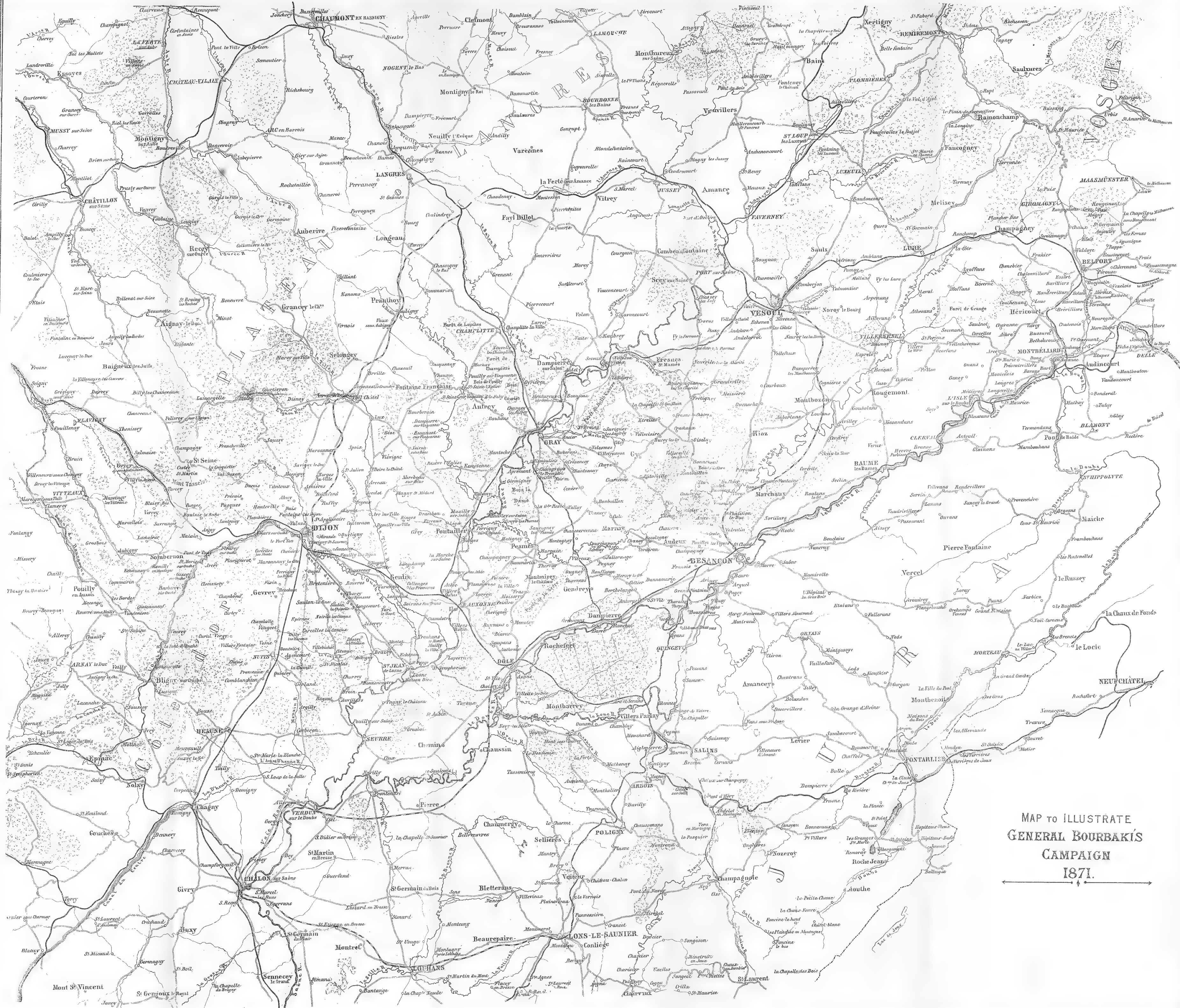
FORCES ON EACH SIDE.

FRENCH.
 XV, XVIII, XX, XXIV
 Corps, Cremer's Division. Rol
 land's 7th Military Division, all
 under Bourbaki, about 150,000 men.
 Garibaldi with a division at Dijon.

GERMANS.
 Von Werder's force consisted of
 the XIV. Corps, including the
 Baden Field Division, a combined
 Prussian Brigade, and the 4th
 Reserve Division, with a detach-
 ment under Debschitz, in all about
 45,000.

Von Tresckow I. besieged Bel-
 fort with about 15,000 men, but
 out of these he sent detachments to
 Von Werder.

The II Corps (Fransecky's) and
 the VII (Zastrow's) were about
 50,000 strong and were both placed
 under Von Manteuffel.



MAP TO ILLUSTRATE
 GENERAL BOURBAKI'S
 CAMPAIGN
 1871.

DATES OF IMPORTANT EVENTS.

- December 23rd.—Bourbaki's army begins to move from the Loire to the Doubs.
- January 1st.—Germans in no small perplexity as to the French plan of campaign.
- January 5th-6th.—Germans clear as to Bourbaki's design; distinct orders to II, VII, XIV Corps in regard thereto.
- January 5th.—Outpost actions between Werder's troops and the French in the neighbourhood of Vesoul.
- January 6th-7th.—Slight skirmishes.
- January 8th.—Bourbaki proposes to attack Werder's left and rear and to cut him off from Belfort.
- January 9th.—Action at Villersexel.
- January 10th-11th.—Von Werder moves from Villersexel to the Lorraine.
- January 12th-13th-14th.—Germans strengthen their position on the Lorraine. French inactive.
- January 15th-16th-17th.—Battle of the Lorraine. Siege of Belfort continued.
- January 18th.—French retreat, followed slowly by Von Werder.
- January 19th.—II and VII Cross the Cote D'or to the Valley of the Saone; Kettler detached towards Dijon.
- January 19th.—Manteuffel determines to cut off Bourbaki from all his lines of retreat.
- January 22nd.—French concentrated at Besancon.
- January 22nd.—Von Werder on the line Rougemont-L'Isle sur Doubs.
- January 23rd.—French communications between Besancon and Lons-le-Saunier occupied by Germans.
- January 24th.—XIV Baume-les-Dames, thence to Riez to Marnay and back to the Doubs, ordered to press enemy vigorously.
- January 25th.—Bourbaki resolves to retreat on Pontarlier.
- January 26th.—Germans advance into the Jura Mts.
- January 27th-28th-29th.—They close in on the retreating French from every possible road.
- January 30th.—II carries Frasne while VII and XIV march on Pontarlier. French pinned fast at Pontarlier with back to Swiss frontier.
- February 1st.—Germans take Pontarlier; II has a severe action at La Cluse with part of French rear. Garibaldi driven from Dijon.
- February 2nd.—Remnant of French in a wretched condition enter Switzerland.

GENERAL BOURBAKI'S CAMPAIGN

IN JANUARY AND FEBRUARY, 1871.

BY

T. M. MAGUIRE, Esq., LL.D.

(Inns of Court Rifle Volunteers).

*(A Lecture delivered at the Royal Artillery Institution, Woolwich,
Thursday, December 13th, 1894).*

COLONEL C. C. TRENCH, R.A., DIRECTOR ARTILLERY COLLEGE, IN THE CHAIR.

THE CHAIRMAN—Gentlemen it is not necessary for me to introduce Dr. Maguire to you, he is so well known among us here (applause).

DR. MAGUIRE—Colonel Trench and gentlemen, I need scarcely say that I consider it a very high honour indeed to be allowed to address the officers of the Royal Artillery again, and that I feel as usual a considerable amount of hesitation at venturing to address such an audience on a military subject; but Major Abdy was kind enough to allow me, some years ago, to give a general summary of the operations undertaken by Gambetta to deliver France from the Germans after the disaster of Sedan, and he thought it well to continue the treatment of the subject, as thus: having first given a general sketch of Gambetta's schemes, going into more detail, and dealing with the several sections of the operations directed by that very able lawyer and rhetorician, and his staff.

The particular section which we treated of last time was Chanzy's operations from the Loire to the Sarthe. On this occasion we propose to deal with Bourbaki's operations. The last time it was Chanzy's operations from the Loire, across the smaller Loir to the river Huisne and the river Sarthe. Against him was operating Prince Frederick Charles, the Duke of Mecklenburg's corps, and three corps that had been at Metz. At the same time Faidherbe was moving from the northern fortresses across the Somme down towards the north of Paris, and was stopped by two corps of the 1st German army, which had been at Metz, viz., the 1st and 8th corps.

It is necessary, just for one minute, that I should recapitulate a little before going on to the details of Bourbaki's operations.

The results of Gravelotte and Sedan were these: that Bazaine was shut up in Metz by the 1st and half the 2nd German army, now called the 2nd German army; that the other half of the 2nd German army

went to Sedan and thence to Paris, as the 4th army, or army of the Meuse; the 3rd German army was on the left of the 4th, and went round Paris to the south, as the 4th army did to the north. Metz was invested on the 19th of August, Paris was invested on the 19th of September. The investment of these two—of the great fortress and of the vast metropolis—occupied four German armies; a German division (the Baden) went down to Strasburg and invested it under General Von Werder. Practically, therefore, by the end of September all the German forces in France, with the exception of Etappen troops, were around Metz, Paris and Strasburg. The capitulation of Strasburg about the 27th of September set free Von Werder, who went into the Vosges district towards Vesoul and Dijon, and a reserve division joining him under Von Tresckow I. (there were two Tresckows) invested Belfort. Now we come to October and the beginning of November.

Gambetta, after the new Government had been formed in Paris, had got out of Paris in a balloon, and after being wafted in different directions in some serious danger from German bullets and otherwise, got to Tours. He then organised armies behind the Loire, in the Sologne district, under D'Aurelles de Paladines.

I need not tell you they were defeated between the 28th of November and the 4th of December. A force of some 250,000 strong, was cut in two by the 4th of December, part of it went between the Loire and the Loir, south of the forest of Marchenoir, under Chanzy, and the other part remained about Bourges and Nevers, under Bourbaki. It is the latter part that we have to deal with.

But how came it that the Germans were able to cope with two corps from the direction of Amiens, the 22nd and 23rd, and a variety of corps along the Loire, the 15th, 16th, 18th, part of 19th, 20th and 21st? The reason why they were able to cope with these new levies of Gambetta was that, in the meantime, Metz had capitulated, and the corps investing that fortress were at the disposal of the German staff; on the 27th of October. Nos. I. and VIII. went north-west; Nos. III., IX. and X., *i.e.*, the Brandenburg, the Hesse and the Hanoverian corps, went to the Loire; II. went towards Paris at first, VII. invested some northern forts. III., IX., X. and the Duke of Mecklenburg's corps, XIII., broke D'Aurelles de Paladines.

Now to come to the beginning of January, 1871. You will observe, gentlemen, that the opportune surrender of Metz by Bazaine, enabled the Germans to cope with the greatest *levée en masse* in history. The *levée en masse* of 1871 was by no means as effective or so well organised as the re-arrangement of the Federal forces in America after the first battle on Bull Run, because it took McClellan from July, 1861, to March, 1862, before he moved his newly organised army; whereas Gambetta did not leave Paris till early in October, and his army was moving and fighting early in November. I must say that great credit is due to Gambetta for putting some kind of soul into an inert mass, and getting some kind of order among these hastily collected levies; credit must also be given to his subordinates, de Freycinet, D'Aurelles de Paladines and others. But for the opportune fall of Metz, it is

quite possible that the siege of Paris by the 3rd and 4th German armies would have had to be raised. That is my opinion, of course if any gentleman differs from me we can discuss his view later on.

Now here we have Nos. III., IX. and X. and the Duke of Mecklenburg proposing to go in a western direction, or rather hesitating as to what they were to do on the 1st of January. We have Nos. I. and VIII. up at Rouen and Amiens, and all the others round Paris.

The only others available for any purpose were II., VII. and XIV.; XIV. was the new corps, consisting of Von Werder's Baden division, of a combined Prussian brigade, and the 4th Landwehr division. Three corps were available for the eastern theatre of operations: Von Werder's men, the II., the VII., and also the division investing Belfort, a reserve division. Gentlemen, I ask you please to remember these data.

As against these three corps, their directing staff not knowing exactly what the French proposed to do, there were available four French corps, two French divisions and Garibaldi's men. Four French corps, those which had originally been part of D'Aurelles de Paladines' army, to wit: Nos. XV., XVIII., XX. and XXIV. (*see* appendix). A new corps was formed at Lyons, Cremer's division had already been engaged in the direction of Dijon; Garibaldi's men were about Autun, south of Dijon.

The German staff were recently criticised in the columns of *The Times*. Well, uncertainty is not confined to military operations, and I do not really believe the German staff deserves the contumely with which they are treated by people who are wise after the event. Napoleon himself was supposed to be as good a soldier as any other in modern times, and was almost the greatest man from an intellectual point of view—since Bacon. Napoleon says that looking back on his past he could see in regard to each campaign a great variety of methods by which he could have improved his campaigns; but it is one thing to look back on the past, and another thing to look forward with regard to the future; anybody can draw up a plan of campaign for people after those people have fought it for his instruction. The critics say that this German staff ought to have known every thing that was going on along the Loire. Well, there were 250,000 Frenchmen all round the district; there were some 63,000 or 70,000 Germans between Vendome and Orleans; and there was about Montargis a corps and about Auxerre a corps.¹ At any rate, whether the German staff ought to have known what the French were about to do or not, they most decidedly did not know what the French were about to do until the first few days of January had passed. They thought that it was extremely probable that General Bourbaki would move north of the Loire; that General Chanzy would move towards Paris from the Loir, and that General Trochu would try to come out of Paris at the same time. They thought there would be a kind of concentrate movement, the two sections of the French army moving on the outer flank of the Germans in the Loire district towards Paris, whilst the Paris people would come south-west towards Chanzy. Consequently they kept

¹ The lecturer, in all cases, pointed out the exact position of divisions on the maps, but to repeat all this would occupy an inordinate amount of space.

Nos. II. and VII. for some time about Montargis and Auxerre, *i.e.* in the main the exact positions varied every few days, and it were tedious and utterly uninteresting to describe merely tentative operations, as they could not know that Bourbaki might go east. I cannot see anything very censurable in the Germans' proceedings. In point of fact Bourbaki did cross the Loire, and did go northwards. But why he went east after a few days is explained by the man most responsible, by Freycinet himself in his book, chapter VIII., of course I have not time to read all these details, but some of them will appear in an appendix should this lecture be published.

A new plan of campaign for the French, which we are about to follow now for the rest of the evening, was drawn up by Colonel de Bigot, who, after drawing it up, refused to fight. To show the confusion which existed at that time, the Colonel in question absolutely refused to fight out his own plan because, we are told, he would not help a Government based on revolutionary principles. There is not the slightest doubt that the intrusion of Garibaldi into this business did much more harm to the French than good. He was followed by a miscellaneous assortment of international atoms who had nothing else to do at the moment, and discharged themselves on France, as they would on Poland, or wherever an oyster could be opened by the sword.

Now what was the plan? The plan was to leave the 15th corps about Bourges, to attract the attention of Nos. II. and VII.,¹ and to prevent them from going east. At the same time they knew that Von Werder had only about 50,000 men about Dijon and Vesoul and at Belfort. He had not more than about 35,000 men about Dijon and Vesoul. I quite admit that he had many more reserve men and a few regular regiments near Belfort—perhaps at that time about 20,000 one way and another; moreover there was a detachment coming down from Strasburg under Debschitz; altogether there might be some 60,000 men, and a good number of those were investing Belfort. The plan was for Bourbaki to leave for a short period, No. 15 to occupy the Germans Nos. II. and VII., and to take Nos. 18 and 20 and to go with those eastward to Besançon—from Bourges to Besançon is about 170 miles,—to concentrate with those at Besançon, No. 24, and to throw out two wings, a right wing of the 7th military division, and a left wing of Cremer's division. It was supposed that this great movement of 150,000 men eastward must necessarily have the effect of overwhelming Von Werder; that as a consequence the siege of Belfort would be raised, they might then leave some behind, and might even make an incursion into Germany by the gap of Belfort; and with the rest, Bourbaki, having re-provisioned Belfort, could go north and cut the line of communications between Paris and Germany—the Paris and Nancy railway, the railways leading across the Rhine to Germany;—in other words, that Bourbaki was to move from Bourges and Nevers by Chagny to Besançon, detrain and advance between the valley of the Doubs and the valley of the Ognon, raise the siege of Belfort, either take Von Werder prisoner or drive him north, send some forces into

¹ French corps are given in Arabic and German in Roman letters.

Germany, and marching northwards cut the German line of communications. There was not the slightest doubt entertained in the mind of any Frenchman, Freycinet, Gambetta, Bourbaki, that that plan must necessarily succeed.¹

Now, gentlemen, there is not the least doubt that the railway was a vital matter. Requisitioning is all very well as long as armies are marching and moving; but a system of requisition would not feed 250,000 men or so stationary round Paris. The requisitioning process with regard to feeding them collapsed at an early period. They had to be fed from Germany, Hamley says by 16 trains a day. It may be interesting to enter into the details of the feeding of the Germans. Personally I am an advocate for the best possible feeding, having regard to temperance, that a man can get, whether a soldier or any other man, and I believe it is all nonsense to preach the doctrine that a soldier would be all the better man if he spent a considerable portion of his life on the verge of starvation. At any rate the Germans did not try the starvation policy; they tried to get all they could; they ate, drank and smoked like heroes; this is what they had per diem, and you can easily see that no amount of requisitioning could provide this bill of fare, and that it was an elaborate business altogether. "Germany throughout the war was the main basis of supply for her armies, whose enormous requirements may be conceived when we remember that in the course of 24 hours each *corps d'armée* consumed 18,000 loaves of 3 lbs. each, 120 cwt. of rice or pearl barley, either 60 oxen or 120 cwt. of bacon or a proportionate amount of prepared sausage, large quantities of salt, coffee, and other minor details." If there is any gentleman strongly addicted to teetotalism in the audience he will be shocked at the next item—"35,000 quarters of spirits and 3500 ounces of orange bitters." But, gentlemen, I am appalled personally, as not being a smoker, at the next item of the entertainment—"To this gigantic repast must be added 60 cwt. of tobacco, 1,100,000 ordinary cigars, and 50,000 officers' cigars for every ten days." There then follows the numbers of letters that were delivered, the number of parcels from soldiers' relatives, and the amount of money that had to be distributed; and it is very obvious that the German soldiers of all ranks were very much interested in preventing this incursion of Bourbaki on their line of supply from home to Paris.

It was not until the 3rd or 4th of January that Von Werder, being at Vesoul, was quite clear that Bourbaki was moving eastward of that place. It was evident from the number of reconnoitring parties and skirmishes to the south, east and west of Vesoul, that very considerable bodies of Frenchmen were in that neighbourhood by the 5th, and by the 6th the German head-quarters had come to the conclusion, partly from information received from Switzerland, partly from their general intelligence staff, and partly from the reports of the outpost engagements as sent to them from Von Werder, that large bodies of Frenchmen were going eastward. Then they issued definite orders, which, by the way, did not reach Von Werder until four days after they were drawn up. Manifestly there must be some science in war, it is not

¹ See Appendix.

merely a fortuitous arrangement of circumstances, because Von Werder himself, without any communication with the head-quarter staff, did precisely what the head-quarter staff suggested that he should do, and all that was necessary when he got his final orders was just to continue the arrangements that he had already prepared. The orders were that he was to fall back to some strong position west of the fortress of Belfort, and that he was not to raise the siege of this fortress. With an excitable population,—as some officers who were there at the time and are now in this room could say better than I can,—with such a population as the French strung to an extraordinary pitch of nervous tension, and very properly strung to such a pitch and displaying the most enthusiastic devotion to their country, which will redeem many of the faults of the French character for ages,—standing out to the last piece of bread or the last rat in Paris, and suffering no end of hardships willingly if they could only deliver their country,—I say, among a population excited to a degree, the raising of the siege of Belfort would have produced a tremendous moral effect. Accordingly Von Werder was ordered not to raise the siege of Belfort under any circumstances whatever, but to stay there, and at the same time he was informed definitely that No. VII. and No. II. would come to his aid, and that calculating distances, and the time of the year, the bad weather and the mountain district through which they had to pass, they might reach him some time about the 19th of January. By this map¹ you will see now No. II. and No. VII. going into the passes of Cote d'Or by three places between Langres and Dijon, that is 40 miles. They could not pass by Langres, it was occupied by the French; they could not pass by Dijon, it was occupied by Garibaldi; but they slid in between the two by three passes, all marked on the map, Longueau, Pranthoy and Selongey, between Langres and Dijon.

A recent military critic says that no finer episode in military history can be found than the manner in which Von Werder acted, between two fortresses—Belfort and Besançon—50 miles apart. I will not go into details, roughly he moved from Vesoul to Villersexel, and then took up a position from Delle to Montbeliard and thence to Frahier. When Von Werder got with the XIV. to the Lisaine, he was to stand on the river till relieved by VII. and II. Meanwhile Bourbaki would probably attack him, but Bourbaki moved in exactly the manner in which it was suggested he should not move. It was suggested that he should expand and move by several roads north of the Doubs and north-west of the Doubs and south-east of the Doubs. It was suggested that he should march in as broad a front as possible and hem in Von Werder on all sides. In point of fact four of his corps came into the limited district between the Ognon and the Doubs, a country full of defiles, as is to be seen from this map, with plenty of woods and hills and dales and the weather being severe in the extreme rendered logistics still more difficult. From the very first evil followed Bourbaki. As Freycinet, p. 228, says: "The campaign of the east therefore was opened under the most deplorable auspices." The first thing that went wrong was the railway

¹ The lecture was illustrated by several large maps.

mobilisation business. A book has been written about that which no doubt is in your library, and is interesting to all officers who have to deal with the movement of troops by rail; it is written by a French Engineer, who was employed by the Ministry of Public Works to inquire into the matter, M. Le Bleu; his report is also in Freycinet's book. He shows that the whole movement suffered a kind of physical and moral paralysis from the very start. These four corps, the 18th, 20th, 24th and 15th (because the 15th came eastward after it had served as a screen for the others) were tied to one line of railway, and that line of railway was badly managed; the troops were standing for days at a particular station, the officers were afraid to move them into the country to get them food, the horses were half starved: there were 150,000 men in a most critical condition. I must say that the cavalry was a very small matter, made up of the *débris* of divers regiments, the proper cavalry of France being at this moment in Germany as the result of the capitulations of Sedan and of Metz. The cavalry was nothing considerable, and I do not suppose if it had been of real value it could have done very much. Certainly the German cavalry in the south-western theatre in the Le Mans campaign, four divisions of them, did not gain much distinction, because they could not do much owing to the weather, the state of the ground, and owing to the character of the country in which they were employed. Therefore I do not suppose that Bourbaki really lost much by not having a good cavalry force. We do not find that Von Werder did anything worth dwelling upon with his cavalry; it was just as much as infantry could do to march on these frozen roads. As I have said therefore, Bourbaki was in difficulties with regard to mobility, even when he was moving by rail, and by road with such a system of commissariat as he had—a hastily improvised commissariat—his difficulties were enormously increased.

I hope that our volunteers will not have a similar commissariat if England is ever invaded, but I have reasons to believe that many volunteer corps would not be perplexed to the last degree if called upon to march and live in Kent. Let their authorities see the results of improvised supply in Bourbaki's army. This commissariat, thus hastily improvised, could not bring the food from train to troops. Yet plenty of food, plenty of ammunition, and plenty of money were at the disposal of the French Government.

So Bourbaki gets along till about the 8th of January, when at last Von Werder comes to the conclusion that it is nearly time to move to his position on the Lisaine, or he would be intercepted. The French were marching on the 8th to the south and east of Vesoul, when Von Werder moved from Vesoul to Villersexel, sent the 25th regiment and the reserve into the town, the Prussians to the right, to a place called Marat, and the Baden folk to the north. By most military writers,—in fact I think in General Clery's book, which we have most of us had to learn—Villersexel is given as an admirable example of the manner in which troops may be stopped by an attack on their flank. Von Werder wanted time. He thought he had near him one French corps, the 18th, and he said, "I will stop you." He attacked it and stopped it; but during the course of the

action he found that he had to deal not merely with the 18th, but also with two other corps, 20 and 24. He accordingly prolonged the action of Villersexel the whole of the 9th, and street fighting occurred at one o'clock in the morning of the 10th; he therefore fastened himself, as to speak, on the French army like a bull-dog, and would not let go his hold until it suited him. The result of that was that Bourbaki halted his three corps and deployed them, and Von Werder calculated that when once his antagonists had turned north and pivoted on their left, it would be some time before they could move east pivoted on their right; he had rightly concluded that such an army had no mobility, that when once it turned out of its direct course such an army as that would take some time before it could resume its original direction. His judgment was exact, his anticipations were realised to the fullest. On the morning of the 10th he expected to be attacked, and Bourbaki expected to be attacked. The German not being attacked simply left a rear-guard, and drew off eastward at leisure, until he came to the Lisaine on the 11th. I think you will find, gentlemen, that the manner in which Von Werder first stopped Bourbaki at Villersexel, and having stopped him marched round his right, and, skilfully anticipating, him got between him and Belfort, and then took up a strong position on the river Lisaine, constitutes one of the most interesting and instructive operations by a small army, some 35,000 men, that is recorded at any rate in modern history. It was a good business-like transaction, a masterpiece of military skill, no flurry about the matter, well conceived and well executed (applause).

The space occupied by the German army of 45,000 men was about 14 miles long from left to right. Debschitz's detachment was on the left, the 4th Landwehr and the Prussian regulars in the centre, and the Baden troops either on the extreme right or in reserve, while Von Treschow with the 1st Landwehr continued the investment of Belfort.

The 7th French military division was opposed to Debschitz, next from right to left were 15, 24, 20 and 18. Cremer's division was coming up.

Cremer deserves a word of well-earned praise; his division of 15,000 men deserved as high honour as they could get. They made a forced march under the most deplorable conditions conceivable. This division had been detained at Dijon till the 9th of January by a piteous appeal from General Garibaldi, who was as full of military nervousness at this time as he had been previously full of political enthusiasm. He mistook the appearance of a few Uhlans for the advance of the whole Prussian army. In point of fact at no time was there more than a brigade detached down towards Dijon, Kettlers's, the 8th brigade, part of the 2nd corps, but it was quite sufficient to frighten the very life out of Garibaldi's people, although Garibaldi, I believe, had 15,000, and de Freycinet says he could have been reinforced to 30,000. Garibaldi delayed Cremer. Then by forced marches Cremer went round to Lure. His troops reached Lure on the 14th of January, wearied, as may well be imagined, when it is remembered that the French soldier carried 60 lbs. weight, and cold—the temperature was exceedingly low, some present may remember the winter, it was a very severe one indeed—and colder still because shoe-leather had failed, and in many instances the men were barefooted.

"This gallant division reached the Lisaine battle-field on the 15th, and opened fire on the Germans on that day. Neither officers nor men had anything to eat from 7 a.m. on the 14th till 6 p.m. of the 15th, although during that time they had marched over 40 miles, and had been for several hours under the fire of the enemy." I am sure that no gentleman present will grudge credit to Cremer.

But, gentlemen, there was another forced march,—fortitude and military spirit not being confined to any one race,—and that was the march of No. VII. and No. II., under Manteuffel, who commanded both, the II. corps being under Fransecky, and the VII. under Zastrow. Let us see what the same writer says about this incident: "The march of Manteuffel has scarcely had a parallel in modern war, and forms a most striking proof of the perfection of the Prussian administration of supplies upon the march. In 16 days his force, with all its trains of necessaries and other impediments, crossed two ranges of mountains, over by-roads, and having enemies at Langres and Dijon, plunged into the heart of one poor district, plunged directly into another equally poor, to intercept and finally to destroy an army numerically twice as large."

When Nos. VII. and II. were thus marching, a desperate combat occurred at the Lisaine on the 15th, 16th and 17th December. First the French tried by their right between Montbeliard and Héricourt; next they tried by their centre principally at a fortified position in front of Héricourt, and finally they tried with their left, when Cremer came up. If permitted, I propose to put in an appendix instances of the different phases of the fight, such as artillery fire, and the way in which the French, issuing from the woods, came under range, features of particular combats, and other matters of interest, but I am afraid that if I were to read any of these now, Colonel Trench, my address would stretch past the legitimate hour.

THE CHAIRMAN—We shall not object on that score.

DR. MAGUIRE—The French failed repeatedly, hour after hour their attacks were repulsed easily, except on the German extreme right, which indeed was the inner and dangerous flank. That Bourbaki did not press them about Frahier from the first is *primâ facie* extraordinary but not so very strange when you remember that the troops were without food, or efficient officers, or thorough training, and were really no soldiers at all; there were 150,000 of them, what Lord Wolseley calls "men with muskets,"—men without boots, without food, without officers to instruct them, without a staff, without everything which is the differentia of an army as compared with a mob. But there was no lack of bravery, and there was no lack of endurance. On the German side endurance and valour were also displayed; but the German staff was wiser about the comfort of its men. I could have gone on reading items about flannels, comforters and mittens supplied to the soldiers. And the Germans used to withdraw as many men as they could back to the rear each day and put them in villages and houses to sleep; whereas the French slept on the ground with the thermometer abnormally low, even for a severe winter. The French

attacks were frequently repulsed by artillery alone. Here you have the German artillery on the defensive playing almost as distinguished a part as the German artillery on the offensive did at Sedan. On the evening of the 16th the German right was broken at Chenebier, by the 18th corps and Cremer's division; but the Germans recovered themselves about 12 o'clock, and they made a night attack. They did not recapture the position, but they stopped the forward movement of the French. On the 17th Bourbaki began to retreat, he ordered a retreat which was continued on the 18th, 19th, 20th, 21st and 22nd, which day saw his army back again at Besançon.

And then took place a fine display of strategic ability. Manteuffel's corps that had been marching to the aid of Von Werder found that he did not require their assistance, on the contrary he sufficed to keep the hindmost columns of the retreating enemy on the move. So Manteuffel immediately came to the conclusion to interpose between Bourbaki's army and every possible avenue of escape to Lyons or elsewhere, to close the line of retreat south,—in other words, to close the various roads between the Swiss frontier and the Doubs. The VII. corps joined in to the right of No. XIV., and the II. corps made a sweep round towards Lons-le-Saulnier. The wretched Bourbaki in a state of despair gave orders for a movement backwards towards the Lower Saone and the Upper Rhone on the 26th of January, but by the 26th of January one hostile corps would be on his right flank, and another corps, the II., in his front. What occurred on the 27th, 28th and 29th I need not detail, the miserable retreating French, in a state of starvation and despair, were driven towards the Swiss frontier by the XIV. corps and the VII. corps, while the II. corps kept continually moving on towards its right and upwards towards Pontarlier, where the final battle occurred, and the French were obliged to lay down their arms in Switzerland in a deplorable condition.

Now this, gentlemen, is merely a general outline of the condition of the campaign; some details, as I said before, I will furnish, though they would take too much time now. But we ought to read some evidence of the awful state to which an army, starting in all the pride, pomp, circumstance and glory of war, can be reduced, in a very short time, generally through the folly of the State, and partly through the incapacity of its staff. 150,000 men, in their own country, started from Besançon about the 3rd of January, were stopped by one-fifth of their force on the 9th of January, beaten by one-fourth of their force on the 15th, 16th and 17th of January, driven to a most disastrous retreat, and pursued by a fourth of their force, and then closed in upon and compelled to retreat into another country than their own by another army one-third of their force; the whole thing not occupying one month, from the 3rd January to the 2nd February. And in what condition did they present themselves to their neighbours after this tremendous enterprise, which was to raise the siege of Belfort, which was to capture Von Werder, and which was to reduce the 250,000 Germans about Paris to a state of utter destitution; what became of them? "Most of these unfortunate men arrived in Switzerland in a state which defies description. . . . Some had bits of wood under their bare feet, others wore wooden sabots,

hundreds had no socks and no boots, and parts of their feet were frozen. None had washed or changed their clothes for a long period. For three days they had neither food nor fodder, and even prior to that period of absolute famine one loaf was often shared between eight men."

How can this be explained, and what lesson can we draw from it? It is explained by General Vial in a very well written and truthful book. The whole fault was the folly of trying to improvise an army at all in the face of a trained, veteran, well-organised army, representing a nation in arms—not conscripts, but a nation in arms. The *levée en masse* of 1793 had to deal with armies recruited man by man, bought under the old system; and a nation of armies rising like the fabulous dragon's teeth, of course, will wear out forces recruited by fragments. But this time the French were rising, 600,000 of them, not against armies recruited one by one from volunteers, but against a million of men (for a million of men were in France) every one of whom had had a military training, and every one of whose leaders knew the art of war. What is the use of a man who is an officer for three weeks trying to compete with a man who has been an officer for ten years? Here were colonels who had been very respectable commercial agents only a few weeks before! What was the German colonel? A very different kind of person. The legitimate chiefs of French military life were in Germany, and from a strategic point of view, the right thing for the French to have done was to have bowed to adversity. They ought to have yielded to fate and made the best terms that they could when their army was thoroughly beaten at Sedan. Their latter levies were badly led, badly organised, badly fed, and the whole thing proves that there is not the slightest use in any nation trying to become a military nation in the middle of a war (applause). Gentlemen, there has been a great deal recently written about the command of the sea, and about the necessity for military preparedness, but certainly if the British race is not in a state of splendid preparation for war, it is not because the leading teachers of the British race have ever uttered any uncertain sound on the matter. I quite recognise and am pleased here to be able to recognise the splendid service done to the British race by a celebrated American writer, and it would be well if many Englishmen were infused with as much enthusiastic admiration for the prowess of this country as is the American naval author, Captain Mahan. But the wisdom of that great writer was anticipated word for word by Lord Bacon in the time of Elizabeth, when he indicated the path that England must necessarily pursue if it was to have command of the Indies, and the command of the sea. I do not care in the slightest degree about all the cant of philosophical humanitarian charlatans; there is only one thing that can possibly preserve a nation, be it China, England, Germany, or any nation. "This is the most certain oracle of time," as Lord Bacon said, that if you want to preserve your nation you must begin to study the art of war, not in the course of a war, but long before a war. If the French had been, as General Niel begged of them to be, organised like the Germans, Gambetta would not have sent 600,000 poor starving wretches against leaders like Von Göben, Prince Frederick Charles, the Duke of Mecklenburg, and Von

Werder to be ruined and disgraced, and discontented with their very existence, without glory or profit. If he had had 600,000 men, all of whom had served in the army and all of whom were directed by military intelligence of the highest order, they would have told a very different tale after the battle of Le Mans and the battle of the Lisaine. And this fall of France, terrific as it was and costly as it was, costing, as Mr. Giffen, the great authority on statistics, has proved, at least £700,000,000 of money to her people, for this appalling pecuniary sacrifice between the 19th July, 1870, and the 2nd February, 1871, what had France to show? The sacrifice of her capital and the loss of territory! Money, territory, fame, and provinces gone in six months! Will money save a nation? No, says Lord Bacon; and I think I ought to direct your attention to that essay on "The true greatness of kingdoms and estates." Money will not save a nation. As Lord Bacon says, "the man who has better iron will take all your gold;" and, as he says again, "numbers will not save a nation." What cares the wolf how many the sheep be? Nor will even military weapons save a nation unless in hands well trained in their use and nerved by discipline. The French had ample abundance of good weapons. What will save a nation? One thing, and one thing only, a military spirit transfused amongst every section of the nation, from the highest to the lowest. And I am sorry to say that I believe that in England that military spirit does not exist as it should, or the volunteers would not be going about hunting everywhere for officers. If the volunteers cannot get officers and efficient privates, I advocate in the strongest possible manner, in the interest of every man in England, even in the moral and physical interests of the working classes as turning them into men, and teaching them to walk erect, I advocate a system of universal service of some kind. We must be ready at any cost. China was not ready, and China is in a contemptible state; 400,000,000 of people with a civilisation 2000 years old, and protected from their adversary by the sea, as we are protected by the sea, turned into the laughing-stock of mankind by a population of less than one-tenth their number. Why? Because that population is at present relatively a military race, and for no other reason. Gentlemen, this most certain oracle of time, has had no more striking example than the proceedings of the army of Bourbaki as against the army of Manteuffel and Von Werder.

I thank you very much indeed gentlemen for the attention with which you have listened to me. You at any rate are not lacking in this military spirit, your regiment has proved it in every part of the globe for generations; but I wish its elevating influence, and its example could be felt and followed by every section of British society,

"There is the moral of all human tales;
'Tis but the same rehearsal of the past,
First freedom and then glory."

(that is, what is better and more necessary than freedom, military power).

"First freedom, and then glory—when that fails,
Wealth, vice, corruption,—barbarism at last."

(Loud and prolonged applause).

DISCUSSION.

THE CHAIRMAN—After the lecture that we have heard, gentlemen, no words of mine are necessary to lead you more fully to appreciate it; but Dr. Maguire has kindly offered to reply to any remarks or questions that any gentlemen would like to ask on the lecture.

With regard to the *levée en masse* of France, I think that France respects herself and the world respects her the more for it, although it was costly to a degree as I need not say.

If any officer has any remarks to make or any questions to ask on the events of the campaign, we shall be very pleased to hear them. Perhaps Mr. Poultney Bigelow, whom we have the pleasure of welcoming this evening, will give us the benefit of his experience.

MR. POULTNEY BIGELOW—Col. Trench, the reflection that I feel like making at this moment is one of gratitude for the kind words that were said in regard to Captain Mahan, who I am sure would have liked to have been present to hear them. If there is anything that could strengthen what the lecturer has so eloquently and forcibly said, it would be the knowledge that all the bad that he has spoken of England is tenfold more bad in the United States. We too suffer in our military administration from the reckless application of popular theories regarding liberty. It would be most excellent for the United States as for England to have short but universal service in the army. Every young man should know how to defend his country's honour, as he knows how to spar and to ride.

It looks now in America as though the time were near when those who represent decent government would have to once more step into the ranks, and exchange cartridges with the mob. Such a contingency would bring forward the serious question of a better military preparation than we have to-day. But as Dr. Maguire spoke of that horrible retreat of Bourbaki's army, one's mind instinctively, I think, went back to the army of Napoleon I. returning from Moscow, when, starting off with all the show and glitter of war, he came back with nothing to speak of except disgrace. He even had his great reputation stained by the cowardice of leaving his army in the darkest moment and hurrying home for his own safety and little else. When I was in Kovno, which is one of the dirtiest cities I have ever seen, the only thing I could find there to cheer me was a monument on which was inscribed—it was on the banks of the Memel or Niemen—"Here there entered Russia 600,000 Frenchmen, and there went back 60,000." I can fancy a delightful book from the pen of Dr. Maguire on winter campaigns in general, taking Bourbaki's campaign and taking that retreat from Moscow, and other notable winter campaigns with a view to discussing the possibilities of winter campaigns. Because I think it must be evident that it was not the winter alone that hurt Bourbaki. The few remarks that Dr. Maguire has given us illustrate that amply. It was bad management, and I think that in Napoleon's campaign there is a pretty general consensus of opinion to-day, that the elements alone did not injure Napoleon; that it was corruption, thievery amongst his officers or contractors—it was thorough bad management. We all remember how, when the troops arrived in Vilna, there was an abundance in the store-houses and still the troops were starving—they could not get at it; those who could, got too much, and the rest got nothing, and the matter is one of particular interest at this moment, because I have noticed latterly, in conversation with officers in staff positions, an exceeding nervousness with regard to a possible war with Russia on the score of winter campaigns; they are always faced by this spectre of the year 1812. I do not know of any book that treats of winter campaigns in such a manner as to have a practical bearing on the possibilities of an invasion of a great country during the winter

season, which inevitably would have to be the case in Russia. And the conditions of railway travel, of course, make the experiences of that war of 1812 almost obsolete. One great German writer who signs himself "Sarmaticus," the very able Colonel Liebert is in favour of a winter campaign as being the most favourable for artillery movement in Russia. There have been some winter campaigns that have not been studied. There was one for instance in the American war against the mother country in 1775-6, when the revolutionary forces marched from Boston, a distance of nearly 400 miles, all the way up through the State of Maine to surprise Quebec. They were unsuccessful, but I have never been able to find a detailed military account of that expedition. Yet there is no reference anywhere that I know of to any great suffering on account of the snow or cold, or want of provisions. And amongst the American cavalry (and in England it is more so still probably) there is a constant requirement of service in the field in winter in which there is no particular hardship on account of snow or ice, although the temperature is infinitely lower than anything that it could have been in that winter in France, and probably even quite as severe as what Napoleon had in 1812.

THE CHAIRMAN—If nobody else has anything to say it remains for me, in your name, to thank Dr. Maguire for the eloquent and spirited lecture that he has given us, and to express to him how thankful we are to him for coming here to-night to give us this treat.

DR. MAGUIRE—Colonel Trench and Gentlemen, I thank you very much indeed. I shall not keep you more than a moment, because there was very little in the criticisms with which one does not cordially agree. As regards the *levée en masse*, I am at one with Colonel Trench; I made a kind of slip, but I was thinking more of the military matter after Sedan than of the moral matter. I certainly agree with Colonel Trench that, from a moral point of view, France did well in having the courage "never to submit or yield, and what is more, not to be overcome" as long as there was a rat in Paris (applause). I am very glad indeed that Colonel Trench corrected me; I certainly blundered in expression. But from the military point of view, looking at it coolly, it seems as if it would have been best to have accepted the situation, as I said before, after Sedan, nevertheless the French deserve our admiration which you, sir, have fittingly expressed for their exalted, Miltonic patriotism and enthusiasm. I was very glad indeed to hear the remarks of our American cousin, whose name is well known in connection with military strategy—*clarum et venerabile nomen*. Captain Mahan's books are one eulogy of our navy, and our method of securing maritime supremacy from beginning to end. The importance of universal service, when Mr. Bigelow was speaking, must have come home to the mind of every officer present, and I will not dwell upon that further. We must look ahead, or we shall meet with worse things than have been described in connection with America by our distinguished visitor. And, certainly, we ought to wish every good to America. Nothing appears to me more discreditable in the history of modern times than the constant cavilling at Great Britain by certain Americans, and the snobbish contempt of America by certain Englishmen; and Captain Mahan, in trying to obliterate these evils has done further good, and I am always as delighted to read his remarks, as I was to hear Mr. Bigelow's. Again, every English military student occasionally feels himself bound to bow before the long line of successful professors of the military art, who fought from 1861 to 1865. We could mention scores of them; four or five will be sufficient: Lee, Sherman, Jackson, Sheridan, Stewart, are as Milton says, "in fames eternal bede roll worthy to be filed."

The honourable visitor alluded to winter campaigns. I do not think there is a book written on that subject; but there were many winter campaigns. If a badly organised army did badly in winter, *pari passu*, a well organised army did well against that badly organised army in the same winter. Von Werder did well

in spite of ice, so did Prince Frederick Charles, and indeed so to some extent did Chanzy. But there was an illustrious winter campaign in which a nation was forthwith overrun and conquered. On the 8th of November, 1808, Napoleon spread himself over a map in a tavern at Vittoria. On the 4th of December, 1808, Napoleon, after defeating four Spanish armies, who had the advantage of rivers and ranges of mountains for their defence, was in Madrid. That was a short and decisive winter campaign. Moreover, some of the principal events, in the last Russo-Turkish war were in the midst of snow in the Balkans. And again it just strikes me that the French conquered the Netherlands in a winter campaign in 1794-5. In point of fact the Dutch fleet in the Texel was captured in the ice, on the ice, and over the ice by a regiment of French Hussars (laughter).

I again thank you Colonel Trench and gentlemen for your kind reception.

APPENDIX.

GERMAN FORCES, XIV. CORPS.—Von Werder.

BADEN FIELD DIVISION—Von Glümer.

1st Inf. Brigade.—Wechmar (Col. Bayer was in this Brigade).

2nd Inf. Brigade.—Degenfeld.

3rd Inf. Brigade.—Keller.

Cavalry Brigade.—Willisen.

COMBINED PRUSSIAN INF. BRIGADE.—Von Goltz.

30th Regt.—Nachtigal.

34th Regt.—Wahlert.

Cavalry.—Walther.

4th RESERVE DIV.—Von Schmeling.

25th Regt. (3 batts.)—Von Loos.

1st Combined East Prus. Landwehr Regt. (4 batts.)—Krane.

Osterode, Ortelsburg, Graudenz, Thorn.

East Prussian Landwehr Brigade.—Zimmerman.

Tilsit, Wehlau, Insterburg, Gumbinnen.

3rd Combined East Prussian Landwehr Regt.—Usedom.

Loetzen, Goldap, Dantzig, Marienburg.

4th Reserve Cav. Brigade.—Tresckow II.

DEBSCHITZ'S DETACHMENT reached Belfort, 29th and 30th Dec.—7th, 47th, 10th, 50th Landwehr, and 2nd Batt. 84th Regt.

II. (FRANSECKY) and VII. (ZASTROW) Corps under Manteuffel, about 50,000, came into the theatre of operations after Jan. 18th.

BESIEGING BELFORT.

1st RESERVE DIV.—Von Tresckow I.

Halberstadt, Preus, Stargardt, Gnesen, Pomeranian, Bromberg, Neulddeseben Stendal, &c. Landwehr and 67th Regt., of which a portion, with the Konetz Landwehr, was at Montbéliard with Bredow.

FRENCH FORCES.

XV. ARMY CORPS.—35,000.

General Martineau des Chenez.

1st Inf. Div.—Dastugue.

2nd Inf. Div.—Rébillard.

3rd Inf. Div.—Petyavin.

Cav. Div.—Garland.

Artillery.—114 Guns.

XVIII. ARMY CORPS.—30,000.

General Billot.

1st Inf. Div.—Fiellet-Pilatrie.

2nd Inf. Div.—Admiral Penhoat.

3rd Inf. Div.—Bonnet.

Cavalry.—De Bremond.

Artillery.—7 Batteries, about 42 guns.

XX. ARMY CORPS.—25,000.

Clinchant.

1st Inf. Div.—De Polignac.

2nd Inf. Div.—Thornton.

3rd Inf. Div.—Ségard.

Artillery.—18 guns.

XXIV. ARMY CORPS.—25,000.

De Bressolles.

1st Inf. Div.—D'Aries.

2nd Inf. Div.—Commagny.

3rd Inf. Div.—Carré de Busserolle.

Artillery—Unknown.

CRÉMER'S DIV.—15,000.

Brigadiers Millot and Tevis.

ARMY RESERVE.—10,000.

Palas de la Barrière.

7th Military Division—Besançon.

General Rolland.

USE OF RAILWAYS.—QUOTATION FROM M. LEBLEU.

“Tout le monde est d'accord sur la cause du désastre de cette armée de l'Est. Son mouvement a d'abord été trop lent, ensuite c'est le défaut de ravitaillement qui a empêché le général Bourbaki de poursuivre son succès après avoir enlevé Arcey, le 13 janvier; les 15, 16 et 17, nos malheureux soldats se sont bravement battus malgré la faim, malgré la température extrêmement rigoureuse; enfin le 18, quand le mouvement de retraite s'est opéré, les vivres ont commencé à arriver; mais les convois, accumulés sur la route que devait suivre l'armée en sens contraire, n'ont été pour celle-ci qu'une cause de désordre.

On a vivement accusé la compagnie des chemins de fer de Paris-Lyon-Méditerranée d'avoir occasionné, par sa négligence, le défaut de ravitaillement et par suite le désastre de l'armée de l'Est. Sans vouloir me faire le défenseur de cette compagnie, je pense qu'une accusation aussi grave et aussi exclusive est injuste. Les employés du chemin de fer ont fait leur devoir, peut-être sans beaucoup d'ardeur

et d'enthousiasme, cependant d'une manière suffisante pour assurer le service, s'il avait été convenablement organisé. Mais cette organisation même péchait par la base, et c'est uniquement dans ce vice qu'il faut chercher la cause d'un désordre qui s'est manifesté dès le commencement de la guerre et qui s'est propagé jusqu' à ces derniers temps. Ayant été appelé d'abord à Saarbruck dès le 3 août 1870, puis à l'armée des Vosges par le général Cambriels, et enfin à l'armée du général Bourbaki, je crois pouvoir émettre un avis raisonné sur les causes de nos désastres.

Un chemin de fer est un outil puissant et docile, mais qui doit être employé avec intelligence. Un personnel nombreux et discipliné est habitué à obéir à des ordres précis émanés d'une direction unique ; il est complètement dévoyé lorsque des ordres, souvent contradictoires, lui arrivent de plusieurs côtés à la fois. Le défaut d'unité est donc le vice capital auquel il a été fait allusion, et il sera facile de le démontrer en examinant successivement la question des chemins de fer au point de vue des travaux d'art, des transport des troupes, et des transport de vivres et de munitions."

THE PLAN OF CAMPAIGN.¹

On renoncerait, quant à présent, à marcher directement sur Paris. On séparerait les 18^e et 20^e corps du 15^e, et on les porterait rapidement, en chemin de fer, jusqu' à Beaune. Ces deux corps, conjointement avec Garibaldi et Cremer, seraient destinés à s'emparer de Dijon, ce qui semblait très-réalisable puisqu' on ferait agir 70,000 hommes environ 35, à 40,000 ennemis. Pendant ce temps, Bressoles et son armée se porteraient par chemin de fer à Besançon, on ils ramasseraient les 15 à 20,000 hommes de garnison. Cette force totale de 45, à 50,000 hommes, opérant de concert avec les 70,000 victorieux de Dijon, n'aurait pas de peine à faire lever, même sans coup férir, le siège de Belfort et offrirait une masse compacte de 110,000 hommes, capable de couper les communications dans l'Est, malgré tous les efforts de l'ennemi. La seule présence de cette armée ferait lever le siège de toutes les places fortes du nord et permettrait au besoin de combiner plus tard une action avec Faidherbe. En tous cas, on aurait la certitude de rompre définitivement la base de ravitaillement de l'ennemi.

Quant au 15^e corps, séparé des 18^e et 20^e, il aurait pour mission essentielle de couvrir Bourges et Nevers en se retranchant dans les positions de Vierzon et en occupant solidement la forêt. Plus tard, quand le 25^e corps serait suffisamment formé, il pourrait relever—comme il le fit en effet—le 15^e corps dans sa faction et lui permettrait de grossir, s'il y avait lieu, l'armée de l'Est.

Pour le moment, la présence du 15^e corps à Vierzon devait avoir un autre avantage c'était de dissimuler le mouvement à l'ennemi. Elle le dissimula en effet si bien que pendant une dizaine de jours, les troupes destinées à renforcer l'armée de Werder (le corps Zastrow notamment) errèrent à l'aventure, de Montargis à Avallon et d'Avallon à Montargis, selon les renseignements contradictoires qui leur parvenaient au sujet de notre armée.

EXAMPLES OF ARTILLERY ACTION.

From the German Official Account, Part II., Vol. II.

BATTLE OF VILLERSEXEL.

The batteries were in a critical position. In an attempt to take up a more effective position further in advance, the 1st Light Reserve Battery had been suddenly overwhelmed with infantry fire from Les Brosses Wood. Two guns broke down, but with the greatest coolness were again made fit to move. Non-commissioned officer Schulz was shot through the breast, but would not quit his gun until it had been brought back (page 316).

¹ De Freycinet "La Guerre en Province," page 222.

ACTION AT CHAVANNE.

It was not until 2 o'clock, when the hostile turning movement gripped the left flank through the wood, that Lieut.-Colonel Nachtigal proceeded through Le Vernois into a new position, east of Champey, which he reached without molestation, as the shell fire of the battery prevented immediate pursuit by the French (page 326).

ACTION AT MONTBÉLIARD.

At Ancienne Citadelle the Loetzen battalion received support from the Insterburg battalion and from the 4th Light Reserve battery, which directed their fire with success against the vigorously advancing foe, as also upon his batteries opening from Allondans (page 332).

On the heights west of Montbéliard eight batteries, at least, of the 15th French Corps had come into action one after another, and these maintained a brisk fire from half-past three until dark. In consequence of the long range the German batteries husbanded their ammunition. The artillery of the château and the heavy guns at La Grange Dame chiefly replied. They compelled the adversary to change his position frequently. The artillery suffered no losses, while those of the infantry were but slight (page 334).

ACTION AT BUSSEREL.

A final attack made at four p.m. was aimed chiefly at the mill. It was vigorously supported by the enemy's artillery, already deployed at Vyans. But the 1st Light Baden Battery from its last position at Bethoncourt, was also able to take part in the struggle round Busserel. From Brevilliers two Baden battalions with two batteries under Colonel Sachs had also come up from General Von Werder's main reserve. The batteries at once drew the fire of the enemy's artillery upon themselves, but directed their own after a short time upon the enemy's advancing infantry and the columns emerging from the issues of the wood, throwing them into disorder. The 4th Baden Heavy Battery, which Captain Von Froben worked with great effect, had considerable losses (page 335).

ACTION AT CHAGEY.

Altogether, therefore, in addition to Captain Schweder's seven heavy guns, there were nine batteries, making a total of sixty-one guns, on the 4000 paces of front from Le Salomon to Luze (page 337).

ACTION AT LUZE-HÉRICOURT.

Since noon five French batteries had been in action west and south-west of Luze, but they were so little able to cope with those of the defenders, that after the lapse of a short time, there were on an average only two guns in several of the batteries fit for action, although the Germans were husbanding their ammunition as much as possible, in view of the difficulty of replacing it. Consequently an almost entire cessation in the artillery engagement took place in the afternoon, until it again burst forth with great vehemence at three o'clock owing to the participation of freshly arriving French batteries.

Shortly after, part of the artillery of the 24th French Corps was turned from Vyans against the position on the Salomon, so that the 3rd Light Battery of the 4th Reserve Division, which had hitherto been in action on the Mougnot, was brought up thither as reinforcement. As the setting sun impeded the Germans very greatly in observing and directing their fire, they limited themselves here to replying only at intervals (page 339).

ACTION AT MONTBÉLIARD.

At 7.30 a.m. a French parlementaire summoned the garrison of the château to surrender. After repelling this challenge, Lieutenant Sauer opened fire upon the

French artillery visible on the Ancienne Citadelle heights, with such good effect that they evacuated their position about 10 o'clock. Two of their guns which had lost their gunners and teams, had to be left behind.

From the houses arranged for defence the French infantry ensconced therein fired into the château most vigorously, rendering the serving of the guns difficult, and caused some losses to the landwehr companies, who answered the fire with much coolness; in other respects, however, the French achieved no result.

A new position which the French batteries, after being driven off by the guns of the château, had taken up in the neighbourhood of Mont Chevis Farm, was also brought under fire by the German artillery from La Grange Dame. The cannonade lasted with moderate strength until nearly 12 o'clock, but increased in vigour when three more French batteries unlimbered at Mont Chevis. In spite of the fact that they had succeeded in gaining cover against the flanking fire from the château of the town and were in prepared emplacements, they were again compelled to frequent changes of position. Thus continued the artillery struggle until three p.m. at which time the adversary's fire ceased for awhile, but then was again resumed and continued until nightfall (page 343).

ACTION AT BUSSEREL.

At Busserel, the 24th French Corps threatened only to break through, without attempting it seriously. There stood assembled at that place, in addition to the Danzig Landwehr battalion as on the 15th, the 1st and 2nd battalions 5th Baden regiment, and two Baden batteries, but the latter were on the height north of the place. Against these, five hostile batteries had deployed as early as 8 a.m. at Vyans. In the clearings of the wood infantry detachments were seen to be forming up, the strength of which was estimated at a division.

With the view of giving support at the apparently threatened point, the General Commanding ordered in consequence General Keller to advance with the fusilier battalions of the 4th and 5th Baden regiments from the main reserve at Brévil-liers. The 5th Heavy Battery which hastened in advance unlimbered at a quarter-past 10 o'clock, on the right flank of the batteries already in action. The adversary's fire visibly began at once to slacken. First the French artillery withdrew and not long after the infantry as well (page 345).

ACTION AT CHENEBIER-FRAHIER.

With the numbers so disproportionate General Keller could not attempt, after the failure of the morning surprise, to drive the enemy from his positions, but only to prevent his advance towards Belfort. This object was completely achieved. The French held in check by the four German batteries which General Keller had assembled at Frahier made no serious attempt to attack (page 354).

ACTION AT LUZE.

Opposite Luze strong bodies of French skirmishers lay at the edges of the wood in readiness to advance, but held in check by the German artillery, they did not emerge to the attack of the French batteries, those at the Bois Communaux more especially took part in the struggle at this place. There also once more appeared the artillery of the army reserve, which had played an active part in the preceding fighting days (page 355).



COAST ARTILLERY IN ACTION.

BY

LIEUT.-COLONEL J. R. J. JOCELYN, R.A.

(A Lecture delivered at the Royal Artillery Institution, Woolwich, 8th November, 1894.)

MAJOR-GENERAL H. LE G. GEARY, C.B., R.A., IN THE CHAIR.

THE CHAIRMAN—Gentlemen, I will ask Colonel Jocelyn to give us his lecture.

GENERAL GEARY AND GENTLEMEN—I propose this afternoon to draw attention to certain technical details connected with the efficient working of the guns of the Coast Artillery, but without any special reference to the particular service those guns may be called upon to perform; for this, I consider, to be less a question of *training*, than of *distribution* of *matériel* and *personnel*, which is, rightly, in the hands of superior authorities, who are able to regard it, not only from an artillery, but also from a naval and engineer standpoint; and, in discussing training and command, we may, I think, very well leave such questions alone. Nor do I propose to touch on the vexed question of ships *versus* forts, or on what a gallant enemy dare or dare not do. Considering the small data we have before us, in view of modern progress, it will be wiser to observe the aphorism, “Do not prophesy unless you know.”

TRAINING: AN ABSTRACT QUESTION.

It is our duty to train the Coast Artillery, so that it may be ready for whatever it may be called upon to do; to make it into a machine, which will work together harmoniously, in all its parts, with as little friction as possible, and with no portion of it subjected to undue strain; and whether its lot may be, to check the raids of torpedo-boats, or fight fleet actions, I cannot see that its training can be effected thereby. No one knows what the future may bring us, therefore let us seek to make it resemble one of those steam hammers close by, which can forge the breech-piece of a “Woolwich Infant,” or crack a nut, if necessary, and until the day of trial comes, bringing with it what it may, let us so work, that we may then hope to justify the money and thought that has been expended on it. Training, of necessity, must be an abstract question.

THE CHAIN OF COMMAND.

I propose first dealing with the new chain of command which has been laid down by authority. It is familiar no doubt to most of you, but in order to clear the ground, I will read two short extracts from official documents:—“A fortress section will be organised for artillery purposes in one or more Fire Commands, of which the size will be

governed by the character of the water areas to be defended, and by the number of forts and batteries which it may be possible for one officer to direct in action: under certain circumstances, it may be desirable to place a Section C.R.A. in command of several Fire Commands; but as a general rule, this officer will not be required, and the Section Commander will then communicate directly with the Fire Commanders. In this, as in all other questions connected with command, the utmost latitude must be allowed to stations. The next link in the chain of command will be the Battery Commander. His unit of command will be decided by local conditions, being governed by the positions of the guns and by the water areas to be defended; but it should in no case exceed the number of guns, which can, under local conditions, be efficiently supervised by one officer. Under the Battery Commander will be a certain number of officers, or selected N.-C.O.'s, who will have charge of the gun groups. They are styled Gun Group Commanders. The gun groups having been settled, with due regard to their efficient supervision by their commanders, they should be collected into battery commands, which should be arranged with respect to the sea areas to be defended, and also to the siting of the gun groups, all of which should either be visible from, or in direct communication with, the Battery Commanders 'Command Post,' the latter being a place selected in the vicinity of the most important group, whither all orders from the Fire Commander will be sent. When a gun has to be fought singly, the Gun Captain will perform the duties of Gun Group Commander. When a gun group is so far detached from other gun groups that it cannot be conveniently included in any battery command, the Gun Group Commander must be prepared to execute the duties of the Battery Commander, in addition to his own, and no Battery Commander will be appointed." "The Fire Command will include such battery commands and detached gun groups as can be worked in combination for a definite tactical object; when a Battery Command is, owing to special circumstances, of such a character that it cannot be allotted to any Fire Command, the Battery Commander must be prepared to discharge the duties of Fire Commander as well as his own, the communications running direct from him to the Section Commander."

FLEXIBILITY.

In the above, the first point I would ask you to notice is the extreme flexibility—the extreme latitude that is allowed to local authorities, who should be in a position to judge how best to carry out the orders laid down. We must have flexibility of procedure in the Garrison Artillery; we are of all arms in the service the most tied down; we fight, as it were, in a strait-waistcoat; we work our guns where they happen to be, not always where we should like to put them. This, of course, cannot be helped; the best intellect of the time is given to choosing sites and designing fortifications; but, unfortunately, permanent works cannot always be altered so as to accommodate themselves to every change in arms or ideas, so we must accept matters as they are and make the best of them. Thus it is, that great flexibility must be permissible. We must observe principles, for if we do not, confusion will result, but the utmost latitude in carrying out details is not only

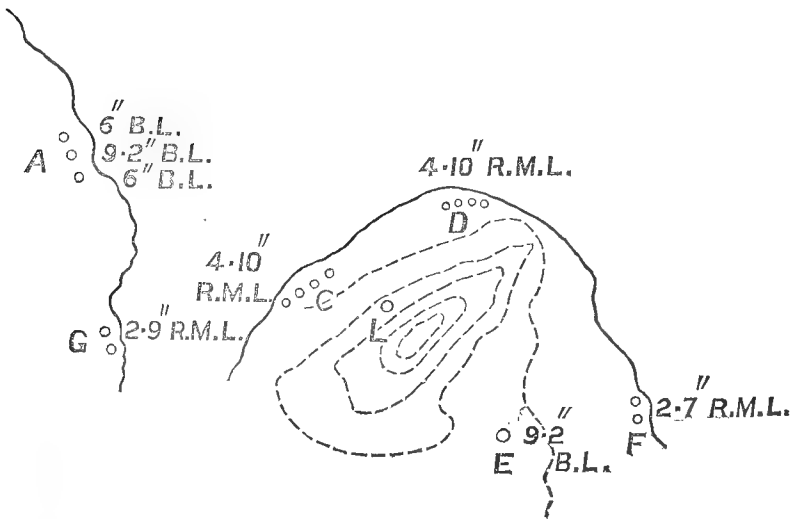
permitted but encouraged by the present orders, which are designed to put the Garrison Artillery on a tactical footing, to knit officers and men together, as in the other arms, and to make it a fighting force, rather than a concourse of scientific individuals, engaged in target practice. Therefore our drill-books must be looked upon as sticks and not as crutches, we must not hang on to them nor shirk responsibility when circumstances arise which prevent the carrying out of the strict letter of the law: we can always be pulled up if we have done wrong, we can always remember we have done our best. It is now time to walk boldly forward, not like children learning to toddle; perhaps a little hesitation might have been justified when electricity first came in, being such a mysterious force to all of us, nor can we altogether blame those who looked upon the position-finder, on its first appearance, with something of that consternation, with which the Mexicans, who had never seen a horse, regarded the mounted followers of Cortez: but now as we have become accustomed to these things, they should be treated neither with misgiving nor idolatry, but be recognised, while always servants, as our most faithful and useful friends.

SUPERIOR KNOWLEDGE REQUIRED BY EACH RANK.

The next point to notice is the superior knowledge which must be demanded from each rank: thus it is laid down that Gun Group Commanders must, under certain circumstances, exercise the functions of Battery Commanders, Battery Commanders, those of Fire Commanders, and so on. Those who have any experience of the manning of Coast Artillery, know that it has long been recognised, that the Gun Captains must be looked to very often, to take charge of groups; this is now absolutely recognised: the new orders do not blink the facts; but it will sometimes happen that we must go further, and allow Gun Captains to exercise certain duties, which up to the present, have been among the functions of Battery Commanders. An example will show what I mean.

The battery at A, fig. 1, is not a very uncommon arrangement: there,

FIG. 1.



a 9.2" B.L. gun is placed between two 6" B.L., thus making 3 groups, with a single gun in each, the drawbacks of which I need not point out; it will probably be impossible to assign an officer to each gun, and the Gun Captains of the two 6" will have to take charge of them: also, it is more than likely, that the centre gun alone will be provided with a position-finder, which at most, can give an uncorrected range to the lighter guns. The ranging of these guns will have to be carried out by the Gun Captains, I see no other way out of it.

Then, as we know, a Gun Group Commander when in an isolated position, must naturally take up the duties of Battery Commander; this would be the case at *G*, fig. 1, when the officer in charge of the two 9" R.M.L. would have to be in direct communication with the Fire Commander.

Now if we consider the whole armament shewn in fig. 1, we see that it must be divided into two fire commands; the guns at *A*, *G*, *C* and *D*, all bear more or less on the same water-way and can be handled for tactical purposes by a Fire Commander at *L*. Were it not for the rising ground close to this station, he could also include in his command the three guns at *E* and *F*, which we may consider as some three or four hundred yards distant. But the configuration of the ground removes them completely from his control, as far as action is concerned. These three guns would form a battery command, and the Battery Commander would have, in addition to his duties as such, to exercise fire control as well. He would probably station himself at *E*, where his most important gun is: it, no doubt, would have a position-finder, but the two 7" R.M.L. would probably be fought by depression range-finder, and their Gun Group Commander would have to range them. At *C* and *D* are two normal battery, and four normal group commands. It is evident that each rank must at times be prepared to assume higher duties.

LOCAL MODIFICATIONS OF THE ABOVE.

At the same time it will sometimes be possible, and, in my opinion desirable, for an officer to carry out a certain surveillance over portions of his natural command, which, by force of circumstances, have to act separately when fire opens. Thus, though the Fire Commander at *L* cannot see the guns at *E* and *F*, nor how they are firing, he can very well carry out all the other duties of his rank, with regard to them; as they are close at hand, he can inspect them, see that communications and range-finding installations are in working order, for I think he *should* do this by personal inspection, he can concert with the Battery Commander how he is to act, under certain eventualities, and carry out all his ordinary duties connected with ammunition supply, reliefs, &c.

Then, again, the Battery Commander at *E*, though perhaps he cannot actually range the guns at *F*, is quite near enough to overlook how they are being worked. The Gun Group Commander at *F*, is thus in a different position from the one at *G*, who is isolated, and must in all respects fulfil the duties of a Battery Commander.

At *A* also, if there are one or two officers available as Gun Group Commanders for the three guns, it is quite possible to carry on a certain surveillance over the Gun Captain or Captains, who are acting inde-

pendently. *Minutiæ*, such as these, cannot be included in a drill-book; it is for the common sense of the local authorities, to organise their *personnel* to the best advantage.

With the exception of these considerations, I do not think the Gun Group Commanders and Gun Captains are much affected by the new orders: their duties remain much as they were: the functions of the Battery Commander have, however, been more closely defined, and as his command is perhaps the most important thing in Coast Defence, it is worthy of special study.

THE BATTERY COMMANDER.

A Battery Command is now defined, as the number of guns which can be effectually supervised by one man: it is thus a true tactical unit, and its method of fighting depends upon two things, the range-finding installation and the class of work the guns are placed in.

RANGE-FINDERS.

With regard to range-finders, I yield to no one in enthusiastic admiration of those we have got: the reputation of the position-finder has been damaged, more by injudicious praise than by anything else, more by those who imagined it would work miracles, than by those who knew the true limits of its powers. When used as a range-finder, that is, when the gun is laid over the sights, it is hard to imagine a more complete and useful instrument, added to which, it has a unique value when gun-sights are obscured or guns mounted for high-angle fire. To it also we owe the fact, that the guns of a fortress are now knit together and combined, in a way that was never dreamed of before, for I believe Colonel Watkin was the first to propose and carry out electric communications. It is possible, but not probable, that we may live to see better instruments and better systems, but the first step was taken by Colonel Watkin, and nothing can rob him of that glory. From the introduction of electric communications dates the renaissance of the Garrison Artillery.

The depression range-finder is, I think, a favourite with everyone, and I have just heard that Colonel Watkin has further improved it; he has replaced the slider by a wheel, given a larger arc at the base and a more powerful telescope, and has, in fact, turned out a stronger and a better instrument; but excellent and handy as the depression range-finder undoubtedly is, I need not tell you it cannot do all that the position-finder can. The latter will, I believe, be given to all the more important groups, while the former will be supplied at present, at the rate of one a work. It is, of course, obvious that the nature of this supply intimately affects the method of fighting a Battery Command. Not less in its influence, is the nature of the work, in which the guns are placed.

With regard to the Battery Commander, I wish to draw attention to the three following points:—The targets he can engage, his position in action, the responsibility of correcting fire.

TARGETS.

The number of targets that can be engaged simultaneously, will de-

pend on the range-finding installation ; if a depression range-finder is employed, only one target can be dealt with, whereas, if there is a position-finder per group, each group can fire on a separate one. For my own part, I am somewhat afraid that this idea of engaging several targets at a time by one Battery Command is liable to be pushed too far : we must remember that if we want to lay guns over the sights, we must have a clear view, and this, practically, independent group firing, may lead to great interference from smoke, especially in casemates. Seeing that a Battery Command does not comprise any great number of guns, I should almost prefer to deal with one target first, and then get on to another : for it is more important to absolutely crush one objective than to partially damage two. I do not mean to say that two targets at a time should never be engaged, but when it is necessary, the question of smoke must not be lost sight of, and groups controlled accordingly.

The next two points had better be considered, first in an open fort and then in casemates.

POSITION OF BATTERY COMMANDER IN ACTION IN AN OPEN FORT.

In a fort of any command, it should be an easy thing to establish the command post in close vicinity to the guns, and also in a place, whence the water-way would be visible, a depression range-finding pedestal being also close at hand ; for it would be well to always provide this instrument. On a low site, this might not be so feasible. However this may be, once action is imminent, the Battery Commander would select a position from which he could see his water-way, leaving a representative at his command post, if the same were not quite close at hand, in reach of his voice. Such a position is an absolute necessity, with one exception. Naval officers tell us that the best way to silence a fort is to come in close and overwhelm it with fire : granting that the ships have come in close, then the time for range-finding has passed by, guns would have to be laid by aid of the sights alone, and fired as quickly as possible, and the Battery Commander would be with his men, beside them, close in touch with them, encouraging them in their work and sharing their risks. On the whole, the question of the Battery Commander's position in an open fort is a fairly simple one.

CORRECTION OF FIRE IN AN OPEN FORT.

Next we have the question, by whom shall corrections be applied to the range, as found by the instrument? Now, when the position-finder is employed I believe this matter can be left to the observers, but even then, the Battery Commander should have the last word. But with the depression range-finder this is impossible : the observer is fully taken up, keeping his instrument on the target, and if the drum-reader calls out its indications correctly, it is as much as we can ask of him. In this case, I think, the Battery Commander must take charge of the corrections, and, if he has to leave the vicinity of the instrument, he must employ someone else to do it for him. As a rule, I think the method of fighting an open work is easily determined.

THE FOREGOING QUESTIONS IN CASEMATES.

In casemates, however, in considering the two foregoing questions,

we are face to face with certain difficulties. A Battery Commander can never be in touch with his men to the same extent, as in an open work, and a position on the roof of the fort is almost forced upon him; for, were he even on the actual gun-floor, he could see, at most, two or three detachments at a time. We must rest content with placing him where he can see his water-way, and at the same time be in easy reach of any place, where circumstances might demand his presence. This difficulty is emphasised, when we have two tiers to deal with, especially if the fort is one, which must be divided into two battery commands, which division should be vertical and not horizontal. The latter arrangement is necessitated by the consideration that, the smoke of one group should not interfere with the laying of another. Rigid control of the group fire will have to be carried out, and rapidity be sacrificed to the necessity of a clear field of view.

While the normal method of correcting fire must be the same as in an open fort, there will be great difficulty in carrying it out, and the position-finder will lose a good deal of its special advantages when placed on the roof, a position which cannot always be avoided. When opportunity arises, battery salvos should be employed.

Cases also will be found, where normal methods altogether fail and special arrangements have to be made, such as firing at fixed points or fixed trainings, average ranges to the fairway being taken. These arrangements must be worked out locally, to suit the special difficulties of the case.

THE FIRE COMMANDER.

With regard to Fire Commanders, I would lay stress on their getting a good hold of their commands, on their regarding it as a tactical body, for whose training for action and general readiness for any emergency, they are directly responsible. The important duties of organisation and preparation are in their hands and should be thoroughly appreciated by them. The limits of their command depend on local circumstances entirely, and the wording of the order should be carefully considered in each case, namely, "the size of a fire command will be governed by the character of the water areas to be defended, and by the number of forts and batteries which it may be possible for one officer to direct in action." The control they can hope to exercise in action, will, also, depend on locality, and its possible limits should be determined, as far as possible, experimentally. It is a matter that we do not know much about, and certainly wants working out.

SECTION C.R.A.

The Section C.R.A. will, "as a general rule, not be required," the necessity for one would depend, not on the number of the Fire Commands, but on their distribution, the water-ways commanded, and the possibility of concentration of fire.

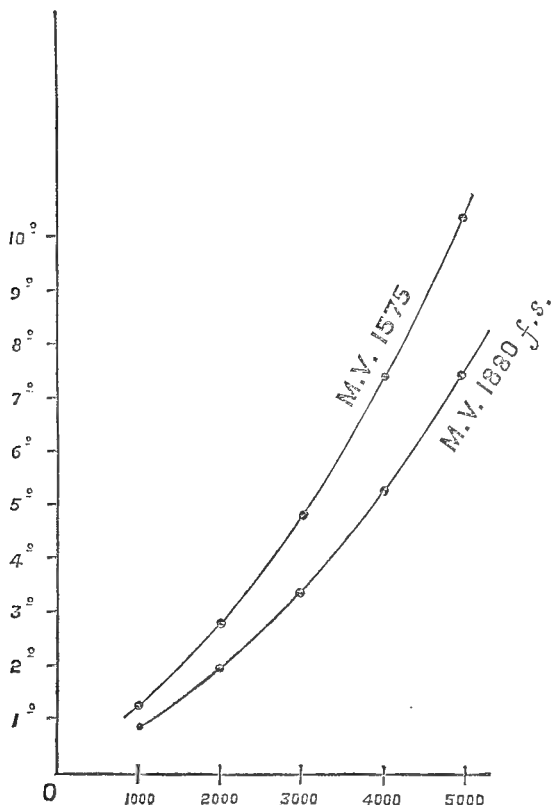
RANGE CORRECTION.

I now wish to draw attention to certain points that require either elaborating or working out. The first of these is the "corrections for range." We are accustomed to consider this, as depending on the three factors—powder, tide and travel of target. Under the heading powder

we class the united effects of variation in powder, bad drill, temperature, atmospheric conditions, age of gun, and "personal factor" of gun, a formidable array enough. If, however, we assume that the powder is good, and eliminate such preventable disturbing causes as bad ramming home, damp sponging, &c., we have what is called the "error of the day" left, which of course, in any particular gun, will have a certain effect on the muzzle velocity. It is useful to consider this effect by itself: and here, let me say, that I know it is impossible to consider these effects separately in actual action, but, as it is not feasible, as I shall attempt to show, to correct fire properly "shot by shot," it is proper that we should think out, before action, how the various disturbing causes affect the shooting, try to eliminate them as far as we can, and where this is impossible, to leave as little as may be to individual judgment in war time.

In figs. 2 and 3 I have drawn the curves of range and elevation in

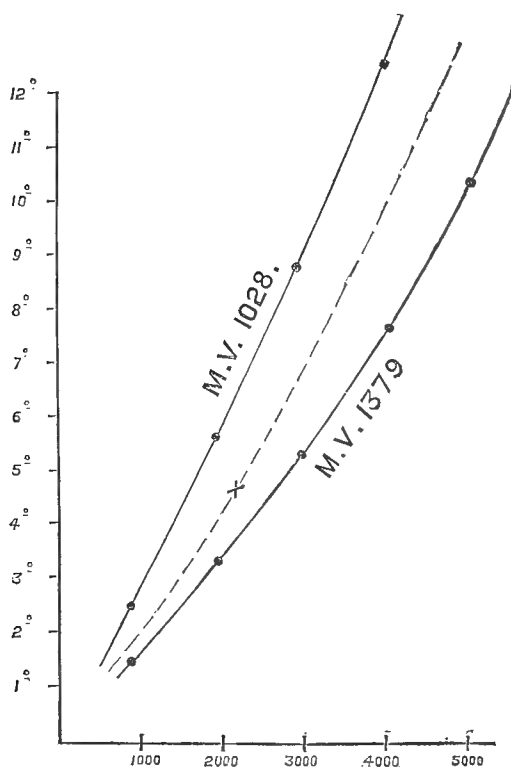
FIG. 2.



the cases of the 6" B.L. (80-pr.) and the 10" R.M.L., each with two separate muzzle velocities. From these curves it is seen how the muzzle velocity affects their range, and, as a practical example, I may say that two years ago, at Sandown, we constructed a range table from fig. 3, which gave us very good results. We were firing with reduced charges, but found that the indication of the published range table had always to

be very liberally corrected by the officer conducting the fire. Knowing

FIG. 3.



the proper elevation for a certain range, at which a good number of rounds had been fired, we had a fixed point on a new curve, which we sketched in between the two others, and the results, as I have said, were very satisfactory. But, as a rule, we are only provided with a range table for one fixed muzzle velocity, so that, if we knew the elevation, different from that laid down, due to a certain range, we would still be in doubt as to other ranges. I think, however, it would be a good thing for a Battery Commander to have the curves for range and elevation drawn out for his guns, not, of course, for use in action, but for study at leisure. He should also note carefully every round he fires and seek to determine any difference there may exist between guns of the same nature.

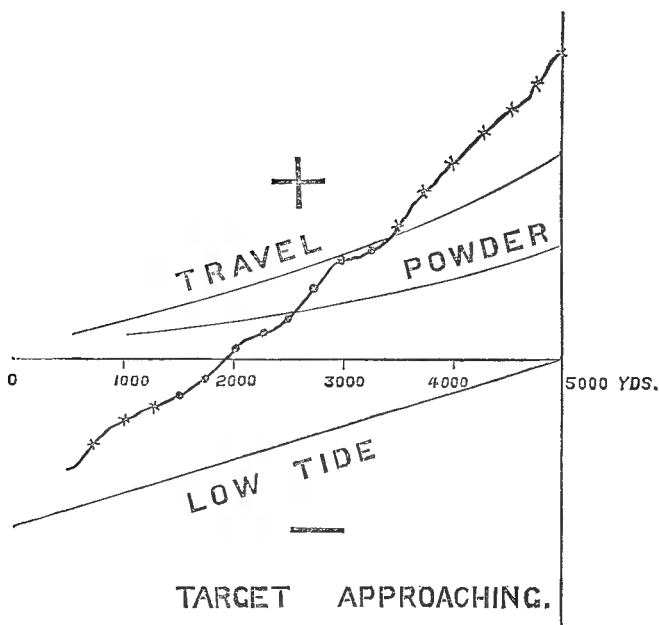
The influence of tide is only at times important, but it may be very serious: thus, with a B.L. gun on a site say 14 feet above mean tide, the rise and fall of the latter being ± 10 feet, it might be ± 175 yards.

The correction for travel is seldom properly appreciated, as our practice targets go so slow and keep at such slowly changing ranges; it may be very serious indeed, and amount to 200 yards or more on service.

Now the net correction for all these things has to be applied to the range, but if it is left to one person to account for all, how possibly can

he do so? Let us look at fig. 4, which is perhaps an extreme, but at

FIG. 4.



the same time quite a possible case: it is there seen that the disturbing causes are not constant in their effect, and are sometimes cumulative, sometimes conflicting. Even if we had to deal with "travel" only, I do not think very good results would be obtained by correction shot by shot: we have got to divorce ourselves from the idea, that rules applicable to target practice are any good on service.

I think that when the corrections for tide and powder are necessary they should be dealt with *in the elevation given to the gun*; that is, by some mechanical means, either applied by clinometer or index plate: the former can of course always be eliminated by using Case I., but I should be loath to give up the many advantages of quadrant elevation.

General J. B. Richardson, Captain P. J. R. Crampton and, I believe, others have written on this subject, which certainly wants working out.

The corrections for travel should be, if possible, embodied *in the range given to the guns*. This can be done, I think, simply enough when using the position-finder, but with the depression range-finder it is not so easy. At one time we had "fighting books" with tables drawn out for this purpose: these tables, accurately calculated on assumptions which could hardly be made correctly, are things of the past, and we have drums which at all events are logical in their working; the first idea of their principle was due, as far as I know, to Capt. A. G. Scott, R.A.; but even these would be difficult to use in action, if the targets had speed and there was much smoke about. A duty so difficult, and for which no thoroughly satisfactory mechanical aid is

forthcoming, should certainly, when possible, be in the hands of an officer of experience, and I have already stated my opinion, that the Battery Commander should retain it in his own hands, but, as we have seen, circumstances may arise where it will be practically in the hands of a Gun Captain.

COMMUNICATIONS.

My next point is communications: I think, as far as range is concerned, these are in a fairly satisfactory state, and that both clock and electric dials, each in their place, work very well. The electric order dial, also, has proved itself a most desirable adjunct in casemated works, but the broad question of the interior communications of works wants looking into. We want a good working telephone for what I might call "fighting lines." The Ader transmitter, designed for business offices, is not suitable for this purpose.

TARGETS.

My next point is targets: we have now reduced to an almost machine-like nicety, practice with plugged shell at a single slow moving target. I had the pleasure of showing at the Royal United Service Institution, early in the year, the excellent effects of a season's practice in the Southern District on a record target, very small in comparison with a service objective. The Commandant of the School of Instruction at Plymouth has also shewn me, what I would call a magnificent record of results, obtained this year at Picklecombe, which would not be regarded as a very easy work to fight. There is no doubt we can hit, and hit often, a single slow moving target, but after all, what is that? We have learnt our sword-drill, we must endeavour to acquire swordsmanship. To do this, we want better targets and more practice. An endeavour no doubt will be made to obtain the first; the second can be met by instructional batteries, from which the comparatively cheap 64-pr. ammunition can be fired.¹

THREE OTHER POINTS.

Three other points remain, but I will only indicate them, as I am without any practical experience of any of them. The first is shrapnel shell fire, with time fuzes. I am a believer in the heavy shrapnel, even at night, and I should be glad to see something done, to provide a better time fuze, and to further test this projectile. The second is high-angle fire; this is in its infancy, and we all look forward to extended trials; the third, and perhaps the most important, is the ranging and control of quick-firing guns.

TRAINING.

Lastly, I would say a word as to training. I think each officer, each link in the chain of command, should have definite opportunities for training his own particular unit. Gun Group Commanders should take their detachments in hand, as a subaltern of a field or horse battery

¹ I do not wish to be understood, as undervaluing the good effects of actually working and firing the guns of the service armament: this should, of course, never be discontinued: but in addition, thereto, an allowance of 64-pr. ammunition, for instructional batteries, would be of the greatest assistance, to efficient training.

takes his section; he should train his gunners, through their Gun Captains, in their own special work, pointing out the great number of mistakes that can be made, the adjustments that must be looked to, the use of the clinometer in testing elevating gear, racers, &c., the effect on the shooting of bad drill or loss of time; he should practice the various methods of laying and the easy transition from one "Case" to another; he should cultivate the intelligence of the men, by explaining "what it is all about," and interest them by showing them diagrams of the effect, on various supposed objectives, of the rounds actually fired by them. He should especially train his Gun Captains, and consequently himself, at the same time, in the observation and correction of fire, taking advantage of the practice of other batteries for this purpose. He should never forget that he himself, or his Gun Captains, may be called upon to do this.

The Battery Commander should have opportunities, in an instructional battery, of seeing his detachments at *work together*, learning smart and soldier-like drill, which will bear fruit when they are perhaps scattered, by the necessities of a permanent work. It is very difficult to inculcate real smartness in work, when men habitually drill in isolated pits. He should teach his men to look on their gun-floor as a place of parade, to be treated with all ceremony and decorum: in his own particular command, he should practice complete manning, and if this is impossible for want of men, he should weaken his detachments, so that, while every gun may be supposed to be in action, range installations and communications should be fully manned. At drill, change of system should be often practised, for it must never be forgotten that smoke may, at any time, throw us back on Case III. He should see that his subordinates understand the work of a higher grade, and occasionally make them take the place of Battery Commander under his observation. Seeing that rounds of service ammunition are so precious, he should take care to get as much information and instruction, from every shot, as possible: he should, especially, study the results of his firing, and discuss with his officers the various faults that are sure to crop up. There is not nearly as much discussion of practice as there might be. Above all, he should himself lead in *the study of the water-way*: officers and non-commissioned officers should know all the channels under their guns, where the five fathom line runs, and the ranges to any points, rocks, buoys, lights, &c. that are visible. *Vivâ Voce* examination on the ground itself, as to this matter, would be very useful.

It is especially necessary that Fire Commanders should often take tactical charge of their commands; all command posts, communications, range-finding stations, dials, &c. being put on a war footing, even if the detachments can only be represented by Gun Captains; then the smooth working of the whole can be tested. The coast defences of the empire are now being told off into Fire Commands, and when this is accomplished, these tactical exercises should be constantly practised, always with some definite object in view.

With regard to what I have said on training, I in no way wish to pose as putting forward anything new: the points I have drawn atten-

tion to, and others I have omitted, are, I doubt not, well known and practised in some places, whilst in others, local circumstances entirely prevent anything of the kind, except in a modified form. I only say, when it is possible, it ought to be done.

In conclusion, there is one other matter, very germane to the present subject, which I would beg permission to touch on: I think every effort should be made to encourage *esprit de corps* amongst the younger officers. A subaltern, for example, would be more happy and have less of that feeling of unrest, if he had more, I will not say to interest him, but more to do him credit, something to take a pride in. I know there are many practical difficulties in the way, but if a certain portion of a gun-floor was an officer's own, so to speak, and if he were more intimately associated with the training of a definite portion of the battery, we might hope to establish in the Garrison Artillery that healthy emulation which exists amongst section officers in the mounted branches. Drill that is not carried out smartly is worse than no drill, and this smartness is very difficult, nay impossible, to obtain, when an officer is in charge of squads 200 feet apart; there can be no interest in the drill and the men get into slovenly habits, while the officer often consults his watch; but, on the other hand, there are parades, which would convince anyone, that there was no prouder command than a smart battery of Garrison Artillery. When local circumstances permit, regard should be taken of the place of parade.

There is also an idea that in the Garrison Artillery, there is little chance of active service; as to that, I think if we read the records of the Regiment, and look back upon its story of honourable endeavour, we shall have to admit, that the Garrison Artillery—the sturdy trunk from which the Regiment sprang—has, in comparison with its more brilliant branches, borne a fair share of the heat and burden of the day, and that it may claim to an equal heritage in that long record of services, which is crystallised in our motto “Ubique.”

DISCUSSION.

THE CHAIRMAN—After the very interesting and able lecture that Colonel Jocelyn has given us, in one sense there hardly remains anything further to say, unless it be that the subject is so vast that more than double the time might have been spent upon it without tiring our attention.

I do not propose, to go over all the points that Colonel Jocelyn has touched upon, but I think that one of the most important is the necessity for preserving flexibility. There is great danger, in the fighting of Garrison Artillery, that we should become, as it were, manacled by the necessary buildings and fixed communications with which we cannot dispense. This flexibility should, in my judgment, extend not only to the duties of the different officers, in giving them a very wide discretion, but in adapting the principles, rather than the letter of the book, to the circumstances of the place they have to fight. I think the communications should be put down in such a way that they could be very easily removed and changed from time to time as our knowledge advances and the necessities of the problem

before us become more apparent. I cannot conceive anything that would bring us back into a fossilised position more than not to be able to move these communications from time to time. You will not get two generals in the field to fight a battle precisely in the same way. Similarly, in fighting the guns of a garrison, every man will have his own idea, and no two men will probably pursue precisely the same tactics. Therefore, as I have said, all these communications ought to be laid in such a way that they can be moved from time to time.

Now, as an instance of the flexibility which it is necessary for the officers to observe in carrying out their different duties, I may take that vexed question about where the duty of the battery commander and where the gun-group officer's duty begins and ends. Circumstances must dictate that; it is impossible to lay down a hard and fast line. Take, for instance, the case that Colonel Jocelyn alluded to—a circular fort with two gun-floors, one above the other—those guns are grouped vertically, not horizontally, and, therefore, the group officer practically disappears. Each gun on each tier—the one gun on one tier and the other on the tier below it—are both actuated by the same position-finder; in point of fact the guns are worked on each gun-floor independently of each other. The fort has to be sub-divided vertically rather than horizontally. I mention that as a good reason why we should not allow ourselves to be tied hand and foot to the mere letter of an order.

With regard to what Colonel Jocelyn said about *esprit de corps* and smartening up the officers, I am sure that we can have no difference of opinion at all. To anybody who has seen Garrison Artillery in the last few years it must, I think, be the greatest happiness and joy to see what a wonderful advance has been made. I can only say, from my own experience, that I am no longer inundated with a number of applications for immediate transfer from the Garrison Artillery. I do not mean to say that some do not want to leave it to go to the field, but I mean that they are less numerous than a few years ago; and I feel sure that as years go on—every year bringing with it some fresh interest and something new—the *esprit de corps* in the Garrison Artillery will go on increasing.

We shall be very glad to hear any gentleman who would like to take part in the discussion.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—Colonel Jocelyn—in illustrating how, in the chain of command, each different commander might have to exercise the functions of a higher grade, that is the gun-captain act as group officer, the group officer as battery commander, and so on—made, I think, so far as I could catch it, a slip of the tongue. In the first illustration that he gave I think he said (at all events I so inferred it) that the gun-captain went up to battery commander. I think that must have been a mistake.

LIEUT.-COLONEL J. R. J. JOCELYN—I meant that he might have to fulfil certain functions of a battery commander if there were no group officer. Take the case I mentioned where a single gun is left in sole charge of a gun-captain. All he gets is his uncorrected range; he would be obliged to observe and correct his fire and would thus exercise some of the most important functions of a battery commander.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—You mean there that one gun is a group.

LIEUT.-COLONEL J. R. J. JOCELYN—Yes.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—I understand the point now, but it seems a big jump from gun captain to battery commander.

Then with regard to firing at two targets, I quite think that with one depression range-finder one target is all that you can manage; at the same time I do not see why the smoke should interfere with your firing at two targets. I think that you

might often be able to fire at another target because one was obscured by smoke. I agree with what Colonel Jocelyn said, but I do not think that his illustration was quite a happy one.

Then with regard to the targets that we fire at, that target on the diagram, I take it, is the section of a ship that is supposed to be approaching you?

LIEUT.-COLONEL J. R. J. JOCELYN—Yes.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—And as you fired at it I think you said that the range did not vary very much?

LIEUT.-COLONEL J. R. J. JOCELYN—Yes.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—But the ship if moving end-on at a constant range must have been going sideways across the battery?

LIEUT.-COLONEL J. R. J. JOCELYN—No, I did not say that we fired at the ship; we fired at the record target shewn on the diagram, and it moved at a slow rate. I merely used this for the sake of comparison, to emphasize that, if we could land two shots out of four in that small record target, we might possibly expect to do the same thing, on active service, when firing at a real objective.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—I am glad that you have entered upon the subject of targets, particularly an advancing and receding target, because it is a thing that we very much want. Nobody has yet produced an advancing or receding target, and, if anybody would do that, I think it would give an immense lift to Garrison Artillery and to their practice. With the record targets that we have hitherto fired at, the better the practice the more difficult it is to make a target that will record it; but, at the same time it must not be considered that the record targets are a failure, because they have taught us to shoot. There is no doubt that the artillery did not know how well they could shoot, or take such an interest in their shooting until the record targets were made. Therefore, however much they may be smashed up, it does not follow that they are to be done away with, and that we are to go back to the old system of the Hong Kong.

About telephones and telegraphs, personally I hate the telephone. It is most distracting to hear a man talking through the telephone—calling up his fellow, and all that sort of thing. I defy anybody to keep his head with a telephone going very near him, and, if we could by any possibility substitute the telegraph for the telephone, I think it would be an advantage. Of course it would require a more highly instructed individual, which it is harder to get; but that should be our aim. And for that reason I think that the electric order-dial is a good invention. Certainly at Picklecombe, where you have a fort with two tiers, and where the battery commander has no chance of seeing what his gun group commander is doing, I think the electric order-dial has worked very well.

As to corrections, my friend on my right (Major Hansard) is too modest to speak about what he has done himself, but I think he is now in the way to bring forward corrections by slide rules which will work the corrections automatically. I do not say that his is the best thing that can be made, but I think that something in that direction will be a great help to us in the future.

Colonel Jocelyn has also entered into the question of smartness of the Garrison Artillery. Now a garrison company has to take charge of an armament that is equivalent to that of about three ironclads; about 100 men have to do what 1500 sailors and marines have to do on board ship—their work is hard work and rough. I only wish we could have the same bright gun floors and polish that you see on board ship; but when you think that one man has to do the work of something like fifteen others on board ship, you can scarcely expect him to do it with the same degree of finish. And with regard to the garrison gunner himself, I think that everybody who comes from a Field Battery to Garrison Artillery is astonished at the grand physique of the garrison gunner. He is a grand fellow. He is ready

to adapt himself to almost anything that he is called upon to do. When you see the way in which these men do their work, whether it is mounting heavy guns in the narrow passages at Horsesand or Delimara Forts, or working ankle deep in water on a steam tug in half a gale of wind off Fort Picklecombe—when you see them march past without any sort of practice, and with officers whom they have never seen, and shoulder to shoulder with men whom they never worked with—you begin to appreciate what a grand fellow the garrison gunner is. He has of necessity often to act on his own initiative, and this gives him a readiness of resource and self-reliance that is possessed, I believe, by no other soldier in the army.

MAJOR F. G. STONE—I think, sir, that as the subject of record targets has been touched upon, it may be some satisfaction to know how the matter stands at present. From what Colonel Rainsford-Hannay said, some of us might think that possibly there was some idea of letting the record target go. But far from that; every effort has been made during the last year to secure one type of record target which will please everybody—with the usual result, that it was found quite impossible to do. The record targets which have been tried during the last summer have, unfortunately, each of them been reported upon most favourably in one district and most unfavourably in other districts; so that, although a very thorough trial was made, the same class of target was not found to suit everybody's requirements. It may possibly end in two record targets having to be adopted; but certainly the record targets will not be allowed to go. We have improved them year by year.

With regard to the question of a Fire Commander—which the lecturer brought out at the beginning of his lecture—who was unable to exercise the functions of a Fire Commander over an adjacent Battery Commander, removed by geographical circumstances to the other side of the hill, or whatever it might be, the lecturer suggested that it would be a good thing for him at all events to exercise a certain amount of surveillance. I am inclined to agree with him to a certain extent; but I think that perhaps we ought to limit that by saying that he should only exercise that surveillance provided that the water area, over which the Battery Commander is carrying out his powers, is also easily seen by the Fire Commander of whom the lecturer spoke, because, otherwise, I think that a Fire Commander coming in to a Battery Commander who was really outside his immediate Fire Command, might cause delay and confusion. I am not quite sure that I followed Colonel Jocelyn correctly in what he said, but that was what I understood.

With regard to the practice of quick-firing guns, the latest experiments that have been carried out were in the Isle of Wight this summer, and the report of the practice led to the conclusion that it was quite impossible to group the quick-firing guns under a Battery Commander, or anything of the sort, with the slightest hope of getting quick-firing results; and that the only thing that the Commanding Officer could do (whether you call him the Battery Commander or something else) would be to give the target and the range to start with, and that after that the guns must be fired by the individual gun-captain, or whatever you like to call him. The objection which, at first sight, would have appeared a short time ago, as to smoke, drops at once when you consider the use of cordite cartridges. Further experiments will be carried out on a more exhaustive scale at Shoeburyness as soon as we have a satisfactory target on which to practice, but the Commandant does not wish to carry out experiments until we have got a target which will travel about 20 miles to the hour,—in which, doubtless, he is right.

With regard to a target which can approach or recede over a sea range, and be fired at with safety, that question has also been taken up, but there are many serious difficulties to be overcome.

CAPTAIN C. ORDE-BROWNE—Is there any order to be followed in the adoption

of cordite cartridges, and is it within visible range of coming into more importance with ordinary guns? What is being done with it? I suppose it comes with the quick-firing guns, and you cannot expect the other for a long time; but is there any exceptional reason why cordite should be more important for the one kind of guns than for the other?

MAJOR F. G. STONE—So far as my knowledge goes at present, I am afraid that the reply would be that the Treasury would insist upon the existing store of powder being used up—the usual thing.

LIEUT.-COLONEL A. A. SAUNDERS—With regard to the remarks made by Major Stone on the subject of the record targets, I think perhaps I should say—as I have had something to do with them this year—that of the three stations (I think it was three) which sent in reports on the targets under trial, one at least—my own—did not have one particular sort of target sent to it. I allude to the Mitchell. I do not know now what the Mitchell targets are like. But with regard to the other targets mentioned by the General Officer Commanding R.A. at Gibraltar, my own experience was a very short one; in fact the target only took one shot and the whole target collapsed. That was the fate which was witnessed by many officers who are here present. Therefore there was no alternative but to say that the target was not a good one. But on meeting the Commandant from the school at Plymouth, at Shoeburyness last week, he told me that he had been able to get eight or ten shots into the target from one company alone. One salvo was fired and the target collapsed, sat down on the water, so that there was no doubt as to what sort of report had to be sent it.

But there are other considerations which govern these record targets; that is to say, the same record target can never be made to suit each station. I do not think you can have one universal pattern target because there is such a thing as storing the targets and keeping them. At Plymouth that big target was kept admirably because it was brought alongside in the Dockyard and lifted bodily by a crane out of the water and deposited high and dry. Down in the Isle of Wight there is no means of keeping that target at all, except by mooring it where it would be very liable to be broken up; or else taking it to a very small harbour, Yarmouth harbour, and putting it on the mud. There is only room for one target there, and we cannot beach it. Therefore the subject of storing targets is a very important one. A target may be very applicable in one station which would not be applicable in another.

MAJOR F. G. STONE—I think the reports that have been received bear that out.

LIEUT.-COLONEL A. A. SAUNDERS—I think it is hopeless therefore to have one pattern record target everywhere. I do not see how it can be done. At present the Ryder target seems, so far as keeping it and storing it, the most easily stored anywhere, because it is easily beached, and can very easily be taken to pieces as well if you want to keep it out of the water.

MAJOR F. G. STONE—I think that is the conclusion we are obliged to arrive at.

LIEUT.-COLONEL A. A. SAUNDERS—But I think we shall never get a target applicable to every station.

I am very glad to hear from Colonel Jocelyn the very good news that Colonel Watkin is going to give us a larger depression range-finding instrument. I look upon the depression range-finder as a most excellent friend to the regiment, and, if it could be made a little bigger, it would be quite perfect. I am therefore very glad to hear that we are to have a larger instrument.

I am also glad to hear from Colonel Jocelyn that he positively dislikes the Ader telephone. My experience of it is that it is an instrument which is constantly getting out of order. I think that any telephone which has a wooden sounding board does not do for military purposes. These telephones are kept in damp places

very often and the boards split,—to say nothing of a gunner occasionally hammering at it, tapping it he calls it, which means giving it a good blow, by which means he thinks he can make his friend hear better. And another thing about the telephone is the telephonist. Not to put too fine a point on it there is no money in it, and we get, as a rule, the third and fourth class men in companies to train as telephonists. There is so much money now among all ranks, that what with gunlayers, range-finding specialists, and other paid employments, the best men in the company are not available for telephonists, and our experience this summer amongst nine companies was that we got the third or fourth rate men sent us to be trained as telephonists. I have even had men sent to me to train who could not read, so that when I gave them a message they could not read it on the paper. They were rejected of course. Then again some men cannot hear through the telephone, although they may be able to speak through it. I know some educated people who cannot hear through the telephone, and dislike putting their ears to it. And again other men's voices are very bad. Therefore when you come to take a company of Garrison Artillery and say, send me ten men to train as telephonists, you frequently have to reject numbers. I think that any other method of electric communication would be better. Personally I have been able to get an A.B.C. telegraph instrument lent by the Post Office Authorities, and it worked with great success. It is very simple to send messages in the code, there are no electric batteries, no shouting down through the instrument, and the men picked it up very well. I hope to have further trials with it next year.

I think Colonel Jocelyn has given us a very good lecture to-night, and we are very much obliged to him. I have heard it with a great deal of interest, as he had taught me a good deal down in the Isle of Wight when I first went there.

CAPTAIN F. M. LOWE writes :—" Being obliged to leave the lecture-room before the conclusion of the discussion, I beg to forward a few remarks on Colonel Jocelyn's interesting lecture.

With regard to the effect of loss of M.V. upon range, it is not absolutely necessary to have the second curve given in Fig. 3 provided for us, although no doubt it simplifies matters.

If we determine the reduced M.V. that will cause the projectile to fall 10 yards short, when the gun is elevated according to the range table for 1000 yards, and calculate the "unders" for that M.V. at each range, we obtain a series of figures that form a useful addition to the range table.

For example an abridged range table for the 10" R.M.L. gun is given :

Elevation.	Ranges M.V. 1379 f.s.	Correcting factors for loss of M.V.
1° 28'	1000	10·0
3° 14'	2000	18·3
5° 18'	3000	25·1
7° 39'	4000	30·8

A Battery Commander, knowing his powder correction at 2000 yards to be 180, can see at once from the above table that at 3000 yards it must be 250 yards.

Or again firing with a reduced charge without a range table, it is found that with 3° 14' elevation the projectile falls 795 yards short of the range given for that elevation with the full charge. By means of the correcting factors, and the range table

for the full charge, the range table for the reduced charge can easily and accurately be compiled.

Thus for $5^{\circ} 18'$ elevation :—

$$\frac{795}{18.3} \times 25.1 = 1090 \text{ short}$$

$$3000 - 1090 = 1910.$$

For $7^{\circ} 39'$ elevation :—

$$\frac{795}{18.3} \times 30.8 = 1338 \text{ short}$$

$$3000 - 1338 = 2662, \text{ \&c., \&c.}$$

Tabulate these results in column A and compare them with the official range table for M.V.=1028 fs. given in column B.

Elevation.	A	B
$1^{\circ} 28'$	565	570
$3^{\circ} 14'$	1205	1205
$5^{\circ} 18'$	1910	1925
$7^{\circ} 39'$	2662	2660

With B.L. guns, in which the M.V. falls off sensibly as the bore wears, and with cordite the want of some such addition to the range table as here given will be felt.

In speaking of sites chosen for permanent works by our forefathers, I am sure that Colonel Jocelyn did not intend to disparage their knowledge, or discourage the study of naval history in so far as it concerns us. History repeats itself and a tactical position in the days of the arquebus is not unlikely to remain the same in those times of Q.F. guns. It is not improbable that we shall return to the wisdom of the ancients and re-arm with modern appliances, forts built centuries ago and abandoned as useless for years. When a mistake in coast fortification does occur, it is usually due to a lack of study of the chart, or a proper appreciation of naval matters. Fort Fisher in the American War is a notable instance of this shortcoming, but badly placed as it was, it proved a hard nut to crack.

With regard to targets the first and most important consideration is speed. We all want a target that records, but if in endeavouring to obtain it we get a thing that will not tow at a fair rate we had better return to the Portsmouth, or other target that will not appreciably take the way off the towing launch. At musketry practice, conditions of range and size of target obtain now, that differ considerably from those in the days of the Brown Bess. On the same principle it is surely not right to provide the same sized target and conditions of range for the 9" R.M.L. and 6" B.L., irrespective of their relative accuracy. The difference between these guns may not be exactly the same as between the old musket and the Lee-Metford rifle, yet I venture to maintain that at the usual ranges the 12 foot target is a great deal too low for the 9" R.M.L. and unnecessarily high for the 6" B.L.

The shooting of the company in the Western District is referred to as extremely good and reflects the greatest credit on the gun-layers and all concerned. Perhaps its not least important point is, that if the cartridges used were the oldest on armament charge, and not made up expressly for the day's firing, this practice should go far to eradicate the want of faith in old armament ammunition.

I think we all wish with Colonel Jocelyn that something could be done to stop the emigration of subalterns from the Garrison Artillery, and are glad to hear from other distinguished officers that things are better now than they were. The young officer in the Coast Artillery sees with envy the submarine miners free to work at

their craft all day and every day, untrammelled by garrison fatigues and employments. He can rarely get hold of sufficient of his own men for gun drill, and yet he knows that the gun is a more important factor in coast defence than the mine. Is it to be wondered at, that he applies to be transferred as soon as possible to the more favoured branch of the Regiment. Simplify Coast Artillery drill as much as possible, remove from it all superfluous mathematics and let him have his men to train and take a pride in, then will the Coast Artillery subaltern have the interest and lose the unrest of which Colonel Jocelyn speaks.

MAJOR H. C. L. HOLDEN, R.A., who was prevented from attending the lecture, has sent the following for publication:—

There is one point in Colonel Jocelyn's lecture that I would offer a few remarks upon, and that point is the subject of electric communications, and my excuse for these remarks must be first of all the great importance of the subject, and secondly, the fact that the *matériel* of the great telegraph and telephone systems of the world has been my special study for the past twenty years, during which time I have had almost exceptional opportunities of judging of their efficiency and suitability for the various purposes of the service.

Any system for electric communication between two or more points must consist of—

- (1) The conductors, whether they be lines, wires, or cables.
- (2) The instruments, and their actuating source of electricity.

As to (1). The conductors should always consist of two wires and not one wire and an earth return; there are many reasons in favour of the two wires, and but one against them, viz:—the expense; in the case of telephones being used it is of prime importance that the best arrangements be made to prevent induction from other wires.

(2). The instrument.

First of all there is the Morse telegraph, recording its message in dots and dashes, and the sounder which is practically the Morse stripped of its recording mechanism.

Secondly, there is the Wheatstone A.B.C. telegraph, in which a pointer moves round a dial and spells out the message letter by letter. I do not forget the various type-printing and writing telegraphs, but they are at present too costly and complicated to be considered at all.

Thirdly, there is the telephone (either the simple magneto-telephone, acting as a transmitter or receiver, or the magneto-telephone used as a receiver only combined with a microphone transmitter) which transmits the actual message spoken into it.

Let us consider the merits and demerits of these three classes of instruments separately.

The Morse recorder has one great advantage in that it leaves an indisputable written record of the message letter by letter, thus fixing responsibility in case of a mistake, against it are the facts that it requires a specially trained operator to work it, and that it is slow compared to a telephone if the message has not to be written down. The sounder, which is in effect a Morse instrument without recording mechanism, has all the disadvantages without the advantage of that instrument.

Next in order comes the Wheatstone A.B.C. telegraph, this instrument, which has been eulogised by one of the speakers, is quite unsuitable, to my mind, for our coast defences; it is not only extremely complicated and costly, but very delicate and likely to get out of order, requiring when it does so not only an electrician but a watchmaker to put it right again, since the introduction of the telephone it has almost completely disappeared, except perhaps in places where it had been

previously installed. It has only one point in its favour, and that is that it transmits the message by letters and not words. It cannot be worked properly without some practice. It does not require batteries to actuate it, it is true, but on the other hand it is far more complicated than if it did, and besides this it will be impossible to do away with batteries in a modern fortress, the probability is rather that their number will go on steadily increasing until electricity is supplied like water, gas, or air, might be from a central source.

Lastly comes the telephone. This, if suitable instruments are used, properly designed to meet the somewhat trying conditions under which they have to be worked, is, I contend, the instrument 'par excellence' for service in coast defence communication.

The pattern of instrument that has been in use hitherto, as the lecturer rightly pointed out, is one that was originally designed for use in the subscribers offices of the Paris Telephone Exchange, and for which purpose it answered admirably for many years, though it has now been superseded by other forms. A great mistake was made in introducing it into the forts around the coast, where it is exposed to moisture, etc., and this I pointed out many years ago myself.

Another great mistake that has been made, and that there is still a tendency to make, is, as pointed out by another speaker, that because the telephone repeats the voice, therefore it is supposed that everyone who can talk or hear can use the instrument equally well, such is far from being the case, and therefore men ought to be selected who, first of all, can talk clearly and hear well through a telephone and secondly are suitable for the responsibility of the post they have to fill. As regards the accuracy of messages through a telephone; if written down letter for letter they would probably be found more accurate than the telegraph, but such a course is obviously out of the question, it is however a good practice to repeat the message to the sender.

I may as well preface my remarks on the subject of a suitable telephone by saying, that the microphone and battery are a necessity to any system; there being no magneto-telephone yet invented which will answer as a transmitter loudly and clearly enough for our purpose.

I am firmly of opinion, that if a good form of telephone were introduced, the objections of many officers in whose hands it has failed would be heard no more, and there would be an universal consensus of opinion in its favour: I consider that each instrument should be complete in itself, with magneto, or other call-bell and battery, and that it should be capable of use either at fixed stations or temporary ones, there being no loose connections or wires beyond those connected to the plug, for connecting to the line wires, which latter would be laid in the ground or otherwise permanently, and brought up to terminal boxes at suitable places, in a somewhat similar manner to that which has been in use at the new ranges at Shoeburyness since they were opened; and furthermore I consider that the instrument itself should fulfil the general conditions laid down in the following specification.

- (1) It should not be affected by damp or other atmospheric conditions.
- (2) It should have a mouthpiece over the microphone to prevent it from taking stray sounds, other than the message, readily.
- (3) It should be dust proof.
- (4) There should be no loose connecting wires.
- (5) The receivers should be in duplicate, one for each ear, and so connected that the failure of one does not interfere with the action of the other; the use of flexible leads and receivers, separate from the instrument, should be avoided.

- (6) The automatic switches must be so arranged that it is impossible for the line to be interrupted, as in the ordinary form, by a failure of the switch to move, and whether the switch is moved or not, the speaking or ringing of the call-bell should not be capable of being entirely prevented by this failure of the switch in its action.

The ringing of the distant bell should be possible whether the switch is on or off. It is most desirable that not more than two stations should be connected on one line; lines that are used habitually for inter-communication between several stations, are generally the cause of delay, misunderstanding, and consequent mistakes.

LIEUTENANT A. S. BUCKLE, R.A.—Having been unable to attend this lecture, I have been allowed to offer, as part of the discussion thereon, some remarks on practice with groups of quick-firing guns; and venture to put forward the following, as the result of some experience lately gained at Shoeburyness in this form of practice.

This experience, though limited, seems to lead to an opposite conclusion to that arrived at by Major Stone in his remarks during this discussion, from the results of practice in the Isle of Wight.

At Shoeburyness a group of four guns was generally used, two 6-prs. and two 3-prs., close together on a low site, and the target moved diagonally across the front of the group. No range-finder was used, but ranging was done with one gun, and rapid fire opened from all as soon as the range was found; the ranging being repeated when rendered necessary by the movement of the target.

The results obtained were satisfactory as regards accuracy, and were certainly "quick-firing," though in this respect the rapidity of fire when using black powder could not be compared with that obtained with cordite, except in a strong wind. There is no doubt that to obtain the considerable results that *should* be obtained with quick-firing guns, the ammunition *must* be smokeless.

It must be admitted that the conditions under which the practice was always carried out, were very favourable: thus there was plenty of notice for preparation for action; the shooting was in daylight; the target, though small, moved comparatively slowly—certainly not more than nine or ten miles an hour; the gunlayers (staff-sergeants of the School of Gunnery) were very highly trained layers, and the men were well accustomed to the guns. No doubt the excellence of the gun-detachments contributed very materially indeed to any good effect obtained: but this merely shows the necessity for special and careful training of the *personnel* for work with quick-firing guns—training of which actual firing should form a large proportion.

Still, granting that the conditions were favourable, good results were obtained from the group fire: and, given well-trained men, there seems no reason why good results should not be obtainable when the other conditions are adverse. If he can depend on his gun-layers, see his target, and observe his fire, the Group Commander has a comparatively easy task: but he must correct on his observations *at once* when necessary, and keep the fire of the group *well in hand*.

It seems impossible to hope that any accuracy of fire can be obtained by leaving the gun-layers to do as they like, after being shown their target and given an *estimated* range; though a large quantity of ammunition would probably be expended.

As Major Stone says, experiments in this direction on a more exhaustive scale are shortly to take place at Shoeburyness: the object I have in view in tendering these remarks will be fully attained if judgment on the merits of quick-firing guns fired in groups be deferred, until the results of those experiments are made public.

LIEUT.-COLONEL J. R. J. JOCELYN—Well, Sir, I do not think there is much to detain you with.

Colonel Rainsford-Hannay was not quite satisfied with my remarks about firing at two targets. I entirely agree with what he himself said, so I must have expressed myself indistinctly. What I meant was, that when two targets are simultaneously engaged by one battery command, the question of smoke must be carefully considered. My own procedure would be, salvos from the leeward flank, first at one target and afterwards at the second.

With regard to our future practice targets, I do not know whether Colonel Bingham told him that he has made a little step in advance this year by hauling the target in with a pulley, which is distinctly interesting.

With regard to the telephone, I think there is a good deal to be said about the poor telephone. I do not think it has quite had a fair trial. The Ader telephone is a telephone for an office; the receiver is all right; it is the wooden transmitter that is the annoying thing, if you have the Ader telephone. The telegraph I am a little doubtful of myself.

I am glad that Major Hansard is working at the corrections. I am sure that we all ought to work at this subject. With the depression range-finder I do not see how the corrections are going to be given, at present, in the case of a quick target, but when we have a position-finder installed, it can, I think, be done.

I sympathise most fully with every word that Colonel Rainsford-Hannay has said about the Garrison Gunner. It was not of him and his work that I spoke, it was more a question of battery organization. Major Barron informed me of some excellent results that he obtained at Malta, by the system I hinted at, and I thought, if opportunity were allowed them, the Garrison Artillery might carry this out elsewhere.

Lastly, with regard to Major Stone's remarks about surveillance. I did not mean that the Fire Commander at *L* should go and interfere with the *fire* of the Battery Commander at *E*, he is not in a position to do so; I merely meant that, were it not for the conformation of the ground the guns at *E*, and *F* would have formed part of his command, so, though he cannot control them in action, he can and should carry out the other functions of his office in regard to them (fig. 1). I have nothing further to say.¹

THE CHAIRMAN—It only remains for me then to thank Colonel Jocelyn for the lecture which he has so kindly and so ably given us.—(Applause).

¹ I have been permitted to see the remarks which Major Holden, Captain Lowe, and Lieutenant Buckle have been good enough to add to the discussion, and I congratulate myself that such valuable matter should be attached to a paper bearing my name; I think they contain special information of very great interest, that in no way calls for comment from me.—J.R.J.J.

CAPTAIN THOMAS BROWN,
CHIEF FIRE-MASTER IN THE WEST INDIES, 1693.

BY

CHARLES DALTON,

Editor of English Army Lists and Commission Registers, 1661-1714.

ON 27th February, 1688⁸, a Royal Warrant, signed by Wm. III. at Whitehall, directed the Board of Ordnance to send 1,000 fire-arms, with ammunition and appurtenances proportionable, to Liverpool to be delivered to the officer commanding the troops at said town. "And you are also to send to the said Town of Liverpool" (so runs this warrant) "6 gunners, 6 gun-smiths, 4 miners, an engineer and a store-keeper to be employed in Our Service in our Kingdom of Ireland." In pursuance of the above warrant a master-gunner (Thos. Holman), five gunners (one of whom was Wm. Bousfield who was destined to plant his foot on the topmost rung of the artillery ladder in a later reign), 6 gun-smiths, 4 miners, an engineer (Captain Jacob Richards who had served his apprenticeship at the siege of Buda), and a store-keeper were sent to Liverpool. The commissions of all the above were dated 12th March, 1688⁸, and, with one exception, they each received 91 days' pay *in advance*. The exception was Capt. Jacob Richards, who received 102 days' pay in advance. The King's Warrant, quoted above, makes no mention of a fire-master being sent to Liverpool with the artillery detachment, but the "List of officers sent to Liverpool" given in Vol. X. of Ordnance Warrants gives the name of a fire-master, viz.: Thomas Browne. The date of Brown's commission is given in above list as 20th April, 1689, and his pay is stated to have been 4 shillings a day. But, unlike the others, he received no pay in advance, and we may safely presume he came off in the end worse than his companions in this matter. No mention is made in the Ordnance Warrant Books of the particular service in Ireland in which this detachment was to be employed, but another source gives us the desired information—"Captain Richards the engineer," wrote Narcissus Luttrell in his *Brief Rotation of State Affairs*, under date of 17th June, 1689, "with several others, that went a pretty while since for Londonderry, are returned, having not been able to get into the town, very narrowly escaping the losse of themselves and ship." Judging from the date of Fire-master Brown's commission (20th April), it is evident he did not accompany Richards's party to Liverpool, in March, but was sent thither a month later. Turning to Military Entry Book No. 2 (Home Office Series) we find, under date of 29th April, 1689:—"Instructions to Piercy Kirk, Esq., Maj-Gen. of the Forces, to go to Liverpool with all

speed, to hire ships sufficient to carry the regiments commanded by Col. Cunningham, Sir John Hanmer, Bart., and Col. Richards from thence to Londonderry for its defence." The above instructions to Kirke were necessitated by the despicable conduct of Col. Robert Lundy, Governor of Londonderry, who, after betraying his trust, had deserted his post and left the citizens to shift for themselves. And though Col. John Cunningham and Col. Solomon Richards, who had been sent to Londonderry with their respective regiments (the 9th and 17th) in March, 1689, cannot be said to have been traitors, yet were they strangely lacking in soldierly duty and zeal for the Protestant cause when they turned their backs on the beleagured town and returned to England with their regiments. "For their perfidiousnesse therein," as Luttrell expresses it, they were removed from their commands and were succeeded by two good men and true—Col. William Stewart and Col. Sir George St. George.

On the 21st May, 1689, Kirke set sail from Liverpool with three regiments, provisions, "and arms for above 10,000 more with ammunition proportionable" (Luttrell). It is very certain that if Fire-master Brown did not sail with Kirke's convoy to Londonderry, that both he and Captain Jacob Richards joined the relieving forces soon after in Lough Derry as will presently appear.

After being driven back by contrary winds to Liverpool, Kirke's ships arrived in Lough Derry early in June. The relieving forces found, on arrival, that the besieging army had erected batteries on each side of the river and had placed a boom, or barrier, across the mouth of the river to obstruct the entrance. The result is well known. After overcoming apparently insurmountable difficulties Kirke relieved Londonderry, by water, on 30th July, and on 1st August the enemy raised the siege and retired. For some time past dogs, cats, and rats, with starch as a farinaceous diet, had been the daily food of the beleagured garrison, and they could not have held out more than two days longer (Luttrell). By virtue of his commission, dated — May, 1689, Kirke took the command of the Londonderry and Enniskillen forces—reduced some regiments and re-formed others. On 6th August, 1689, he appointed Captain Jacob Richards captain of a company of fusiliers to attend the train of artillery, which had been raised for Ireland, and Thomas Brown was given a commission as lieutenant to this newly raised company on the same day.¹ Shortly after these events Kirke joined forces with Schomberg's army which had come to re-conquer Ireland. We hear nothing further of Lieutenant Thomas Brown until 11th September, 1690, when he quitted the fusilier company and was appointed lieutenant of the company of miners commanded by Captain Jno. Pitt—an officer selected by Duke Schomberg for this command 8 months previously. The following extract from a letter of the great Schomberg to the Lieutenant-General of the Ordnance, dated 10th March, 1688, gives the writer's opinion of the importance of this company of miners and of the Artillery Train in particular:—

"And forasmuch as the said Company of Miners doe immediately

¹ Report by Charles Fox to the Lords of the Treasury on Captain Thomas Brown's petition, 19th September, 1692. *Treasury Papers*.

appertaine unto, and are, a part of the Trayne of Artillery . . . I desire the said Company may in the future be placed on the same Establishment with the rest of the Trayne, it being onder the same constitution, and would augment somewhat the Honour and Grandeur thereof which I shall ever endeavour to promote." In his double capacity of fire-master and lieutenant of the miners, Thomas Brown did good service at the second siege of Limerick. "On the 10th September (1691)," writes Colonel Walton in his graphic account of the siege of Limerick, "two mortars were mounted in Ireton's fort under the superintendence of Lieutenant Brown, a very inventive and active officer, and they did great execution." On 3rd October, 1691, Limerick surrendered and the war in Ireland was practically at an end.

The disbanding of several regiments in Ireland at the close of 1691, and the contemplated reduction of the company of miners, caused Lieutenant Brown to look about him in order to find fresh scope for his energies. He soon found a new sphere of usefulness. Colonel John Foulkes' regiment of foot, which had served throughout the Irish campaign, was ordered to be augmented prior to being sent to the West Indies. Two new companies were raised for this regiment by Lieut. Thomas Brown, and Godfrey Richards, late purveyor to the Irish Train of Artillery. These two officers received commissions as captains, 18th January, 169 $\frac{1}{2}$. On 16th May, 1692, "Marie R." signed a Royal Warrant ordering arms to be given to Captain Thomas Brown's and Captain Godfrey Richards' two new raised companies added to Colonel John Foulkes' Regiment of Foot. Four months later Captain Brown was appointed chief fire-master of a train of artillery and mortars to be employed in the West Indies. His commission was signed by Queen Mary (who, as regards the business of the State, was something more than a sleeping partner), and ran as follows:—

"Marie R.

Whereas by Our Warrant, bearing date the 4th August last, We did command that a Trayne of Artillery and Mortars be forthwith provided for Our Service in the West Indies, and whereas We are well satisfied of the loyalty, ability, and experience of Our Trusty and Well Beloved Captain Thomas Browne to be Chiefe Fire-master of Our said Trayne, We, &c., &c. . . . dated Whitehall, 10th September, 1692.

To Sir Henry Goodrick, Bart.,
Lt.-Gen. of Our Ordnance."

After receiving his commission as chief fire-master, Captain Brown proceeded to try and get the arrears of his pay, which amounted to £170, from the Lords of the Treasury. With this idea in his mind he sent a petition to the above-named lords stating his case, fairly and squarely, and throwing out a gentle hint at the end of the petition that he could not possibly equip himself for the coming voyage unless he received his arrears. Brown's case was referred to the Paymaster-General, who did not deny that the petitioner's claim was a just and reasonable one, but added that "as the company of fusiliers raised by General Kirke, on 6th August, 1689, had not been put on the English

establishment till 1st June, 1690, the arrears due to Captain Brown could only be calculated from latter date." This, of course, was a mean quibble, but money was scarce, creditors were pressing, and embarkation was imminent, so Brown took what he could get, which amounted altogether to £142 15s. 8½d., and set out for Portsmouth feeling himself *done brown*!

On 9th January, 1693, the West India fleet set sail from the Isle of Wight with a convoy of 10 men-of-war. Sir Francis Wheeler was Admiral of the Fleet, and Colonel John Foulkes was Commander-in-Chief of all the land forces. The latter deserves special mention. He had fought at Sedgemoor on Monmouth's side and had returned to England with William of Orange. Foulkes commanded his regiment at the Boyne, and was made Governor of Dublin after the battle. His regiment, in January 1693, had several officers of note in it, one of whom was Captain Holcroft Blood (son of Colonel Blood, the great jewel burglar), who lived to have the honour of commanding the English Artillery Train at Blenheim. It is a curious coincidence that a few days before Foulkes' regiment sailed for the West Indies Captain Holcroft Blood was accused of being the person who had lately robbed the Portsmouth coach, and was clapped into Winchester gaol and not allowed to sail with his regiment.

We are indebted to Sir Francis Wheeler's interesting journal, lately printed by the Historical MSS. Commission (Report on the Duke of Portland's MSS., Vol. III.), for an account of the abortive attack on Port St. Pierre, Martinique, which commenced on the 17th April, 1693, by the combined British naval and military forces. "In this afternoon's service it was judged there were 130 men killed and wounded on our side," wrote Sir Francis Wheeler, under date of 17th April, "among which several officers, viz.: Major Nott received a dangerous wound in the groin. Captain Hawkins, Lieut.-Colonel of the sea battalion, escaped very narrowly, a musket shot having grazed upon his skull. Captains Delaval, Picket and Lyons of Colonel Lloyd's regiment. The two first were shot in the arms and the other in the body. Captain Brown, of Colonel Foulkes' regiment, was shot on the thigh, just above the pan of the knee, very dangerously, a great loss, being a very good and the only bombardier and chief fire-master. Captain Thorne of one of the Barbados regiments was killed, and several subaltern officers of all the regiments were killed and wounded whose names I do not know." If Captain Brown did not die of his wound he doubtless fell a victim to the "spotted fever," which broke out soon after on board the fleet and carried off Colonel Foulkes and half the officers in his regiment. "Six sea-captains and 700 out of 2000 seamen" died from the same fever. Well might Sir F. Wheeler say in his journal anent the expedition:—"We have made but a bad hand, and it will doubtless make a noise in the world."

TORPEDO-BOAT RAIDS ON HARBOURS.

BY

LIEUTENANT C. G. VEREKER, R.A.

THE discussion opened by Captain Wray, and followed up in the November issue of the R.A.I. "Proceedings," brings forward one of the most important points for consideration of Officers of the Garrison Artillery.

I notice, however, that none of the papers deal with any recognised scheme of defence, and as this would lead officers not acquainted with the subject to infer that no provision is made for meeting such an attack, I venture to think that a few remarks, the result of what information I have been able to obtain on the subject, will not be out of place.

It is impossible to have one idea suitable to the various ports that would be liable to attack, only some general lines for guidance can be laid down, and a scheme would in every case have to be worked out to suit local conditions.

OBSTACLES.

Booms are in course of construction, or let us hope soon will be, for closing the entrances to our most important harbours, and this seems the most effectual method, if not the only one, of keeping the enemy's torpedo-boats out.

The French seem to realise the importance of this, and stop at no expense in making their harbours secure; at Cherbourg, one of their strongest ports, they have lately connected their two island forts, Ile Pelée and Fort Cavagnac, to the mainland by strong breakwaters, thus completely closing these two passes to torpedo-boats.

If there is no boom, some class of obstacle should certainly be constructed; fixed posts built up near the channel in shallow waters or boats moored at intervals have been suggested; these would carry a few machine or Q.F. guns, which could oppose an effective fire to the advance of the enemy, sufficient probably to delay him and keep him in the illuminated area, and under fire of the shore guns.

An attack by day should not be difficult to defeat, supposing we have an adequate supply of quick-fire guns.

The heavy guns might also fire shrapnel, on the principle laid down for meeting a "Running Past" attack, the fuzes being set at varying lengths to give a wide area covered by bullets.

Service case shot would probably not be effective over 300 to 400 yards, and special case with heavy balls are necessary; even these would not be effective much over 1000 yards.

Warning could be given of an enemy's approach, and everything would be ready to give him a warm reception.

We can look upon such an attack as highly improbable, so what we must consider is a night raid, when torpedo-boats would attempt to run in and do what damage they could, and get out again under cover of darkness.

OUTPOSTS.

Just as a field army without outposts would expose itself to surprise, so also would coast defences if they had no means of receiving timely warning of an attack.

The garrison could not be constantly on the alert and standing at their guns in anticipation of such an attack, or the men would soon get worn out; they must be able to sleep with the feeling that the outposts are there to give them notice of any approach of the enemy.

Sir George Clarke in his paper on "Floating Defence" severely criticises the employment of look-out vessels for this duty; but if Coast Defences are to be of any use, and there is any object in their existence, surely *some* method of allowing them time to prepare for action is necessary.

In the majority of cases, the features of the coast-line would enable a point to be chosen some distance in front of the main defensive position, whence the approaches to the harbour or channel could be observed, a search-light being perhaps provided for this purpose.

In still weather a torpedo-boat can be heard at some distance, and on a dark night the sparks from the funnel may possibly be observable as is the case, I believe, in our latest "Destroyers."

Having discovered the attack, the outpost could then alarm the defenders by rockets or telegraph.

Should it be impossible to have such a point of observation the duty would have to be carried out by boats, but this opens out a very difficult question:—Would the navy ever co-operate to this extent? What should the boats do, having signalled the danger?

A refuge might have to be prepared for them to run into for safety, outside the general line of defence, and the "examination anchorage" would, in some cases, allow of this; however, as these points have no doubt been thought out by those best informed, I will not further venture an opinion.

It would certainly be hopeless for them to try and retire behind our defences, as they would thereby mask our fire, and the artillery should understand that they are to fire at *everything*; otherwise by the time they have made up their minds whether friend or foe, the boats will have slipped by.

Major-General Richardson, R.A., in his lecture on "Defence of a Coast Fortress" said:—"The artillery must ruthlessly sink everything they see of the nature of a torpedo-boat, unless previously warned that it is friendly."

Captain May, R.N., in "Naval Attack on Fortifications" also remarks:—"If the weather is clear, I fancy the defence had better trust to their guns and electric-lights, and sink or disable every boat they see."

Our own navy would have to understand this and take precautions accordingly.

A boat of the "Havock" class would cover about half-a-mile a minute, so we see, that even with warning, there would not be much time for the men to stand to their guns and get ready to open fire, as soon as the boat appeared in the area lighted up by electric-light.

I remember during the Naval Manœuvres in 1889, we had a false

alarm at night, and got the men out and on the guns within 3 to 4 minutes of the bugle sounding. We thought it a pretty smart piece of work, and this would be about as fast as could be expected even with everything cut and dried as it was in this case.

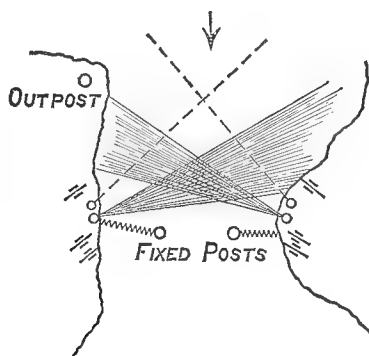
But during these few minutes, a torpedo-boat of the present class would have steamed $1\frac{1}{2}$ to 2 miles, and probably have been past the defences before she could have been picked up and a round fired at her, unless the warning had been given when she was still some miles away, and this could only have been done by a system of outposts.

That such a system should be arranged appears to be of the first importance.¹

ELECTRIC-LIGHTS.

As regards electric-lights, fixed beams would be placed crossing in front of the boom or obstacles, and for this purpose dispersed beams certainly appear desirable, as they would give a larger illuminated zone through which the boats would have to pass and be under fire. Of course the more lights there are the better.

The light being in their eyes they could not see the guns on shore or on the fixed posts firing at them.



I have heard it suggested by an officer of great experience, that to further light up this area, while the boats were delayed under fire, and to prevent dependence being placed entirely on the electric-lights which might get damaged, occasional magnesium parachute lights should be fired from mortars. These would burn for about a minute and would greatly assist in showing the whereabouts of the attacking boats, and increasing the illuminated area, which with two lights only in use, for instance, would be at best comparatively narrow.

Other electric-lights should be placed close to and behind the fixed beams, and in the case of any boat getting through the lighted zone they could get on to it and keep it illuminated; for this purpose search-lights with parallel beams might be the best.

By the above arrangement of lights in front of the obstacle, the chances should be all in favour of the defence; but, in the case of there

¹ Since writing, I notice the following in *The Journal of the United Service Institution*, which shows the importance that others attach to this point.

"The Swedish Government intends to establish high watch-towers along the Baltic coast, on suitable islands, which will be in telegraphic and telephonic communication with the mainland, and from which all movements of hostile vessels can be immediately seen and reported. Prince Oscar, in command of the gun-boat *Ivenskund* has been employed in selecting suitable positions for the contemplated look-out stations."—*Die Reichswehr*.

being no obstacle to stop or delay them, there would be every probability of one or more of the boats passing through safely, as they would attack in numbers; they would then have to be dealt with by the navy, or left to do what harm they could.

Our best, and perhaps only chance therefore is to sink or disable them while in the illuminated area, that is in one minute's firing if as much, supposing only two lights to be employed.

GUNS.

For this purpose undoubtedly quick-firing guns would be the best and we must hope that before long an adequate number will be supplied where necessary.

I believe that it has been substantially demonstrated that the 6-pr. Q.F. at ranges of about 1500 yards, would be capable of penetrating any part of a torpedo boat with destructive effect. The new 12-pr. Q.F. would be a still more formidable weapon in this respect.

It is thus seen that even one lucky shot from these guns would either sink or disable any torpedo-boat at present in use. Their rate of fire would enable a good many rounds to be got off during the short time the boat would be illuminated.

Heavy guns *might* fire case shot or shrapnel with fuzes set to burst the shell at varying distances from the muzzle, and get a chance hit; with smokeless powder they would not inconvenience the quick-firers much, but certainly for night work reliance should not be placed in them to any great extent.

The warning given would probably be very short, and anyone who has seen night manning, or a night alarm, knows the confusion that is bound to occur however well prepared beforehand; *something* always goes wrong; how much more so would this be the case in war time, especially when it is remembered that most of the guns would be manned by militia and volunteers, who, however efficient, would only have lately taken up their station in the batteries, and could not know all the ins and outs of communications, ammunition supply, lighting arrangements, etc., for we must remember that these attacks would very likely take place shortly after, if not previous to, the declaration of war and almost before the troops had been mobilized.

With quick-firing guns on the other hand only a very small number of men are required, and these could be highly trained and permanently told off to their posts. They could sleep in tents or shelters near the guns, a responsible officer being with them who should use his discretion and *not wait for orders from higher authority*. On seeing the rocket or being otherwise alarmed, they could at once stand to their guns without confusion and have time to collect their thoughts, judge the range, and open a deliberate and probably effective fire as soon as the objective appeared.

As regards the method of ranging it is difficult to say what would be the best. If there were no obstruction a ranging gun would have to be employed, the others opening fire as soon as possible; but in protecting a boom, a few buoys should be laid in the illuminated area and the tangent scale elevation to hit them should be known, having been tested by day. These buoys would be the marks by which the officer

in charge would judge his ranges at night when the boats were hesitating in front of the boom.

NECESSITY FOR TRAINING.

A good deal more practice with quick-firing guns is however necessary to train men as layers, and a fair amount of ammunition should be allowed for the purpose.

We are now provided with excellent and most accurate weapons, but unless we get men trained and capable of working them they are useless to us. There is a great difference between training a man to lay a heavy gun and training him to be efficient with a quick-firing gun, this latter above all things requiring a great amount of coolness and nerve, which can only be obtained by actual firing; no amount of drill will ever do this.

I have lately seen a system of firing quick-firing guns with Morris tubes at a moving target representing a torpedo-boat, which is simple and realistic as far as possible, and would enable men to be trained at very little cost to the National purse.

Captain Hawkins, R.A., has a most ingenious idea for firing the heavier guns by electricity, having safety signals, etc.; but would not this be further complicating our already too complicated system?

The present tendency seems to be to go back, and simplify everything as much as possible, and in the case under discussion, none but the simplest methods would ever enable us to be really efficient; the chain of command would have to be dropped, or by the time orders had filtered through, the torpedo-boats would be far away.

Only a general connection between the Fire Commanders and the Sub-Commanders in charge of quick-firing guns and electric-lights would be possible, though there should be no need for even this if orders have been given previously as to the course to be adopted in case of attack.

Simplicity is what we require, and all such things as telephones, speaking tubes, dials, correction cards and tables of all sorts would have to be ignored for this class of night work if we ever wished to hit anything.

A good lamp to replace the present "tracing lamp" is badly wanted, pending the introduction of a reliable night sight.

Summing up, it would appear that with fixed beams, a timely warning, a few quick-firing guns manned by trained gunners under a cool-headed officer with a little common sense, and, if possible, a boom or other obstacle to keep the boats under fire, there should be no great difficulty in dealing with any attack by torpedo-boats on our harbours if we only prepare for them and do not leave everything to be arranged at the last moment.

I have purposely omitted any mention of submarine mines, dirigible torpedoes, and the co-operation of the navy, though these should all assist in simplifying the task of the artillery defence.

SHOEBURYNESSE,
25th November, 1894.

DIARY

OF

LIEUTENANT W. SWABEY, R.H.A., IN THE PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 130, No. 3, Vol. XXII.).)

CHAPTER V.

"E" Troop joins the covering army for the 3rd siege of Badajos. Affair at Llerena. Siege and storm of Badajos. Return to Portugal.

24th February.—This morning came an order to march for the Alentejo which is much sooner than we expected, and I had no horses to move my carriages with, all the old ones, of which I had many, being dead. We contrived, however, without detachments, to get horses enough, and march to Caria where I was well put up. Little or no forage for the horses but corn.

The troop marched with the 1st, 6th and 7th divisions of infantry and two brigades of cavalry, which, under the command of Lieut.-General Graham, together with the force under Lieut.-General Sir R. Hill, a total of 30,000 men, were to compose the army to cover the siege of Badajos, and were stationed, the former about Llerena, the latter in and about Almen-dralejos (*see* Napier, Vol. IV., p. 399).

25th February.—Marched to Capinha,¹ part of the road being very hilly, we got in, however, by 4 o'clock. Green forage was all we could procure.

26th February.—Marched by a good route to Atalaya. Still green forage. We halted on the road for about ten minutes by a rye-field, the men were ordered to cut forage, and in that time filled sacks enough for 160 horses.

27th February.—Marched to Alkains, which is the best town and the least destroyed I have hitherto seen. Horses on rye. I must not omit that Major Downman was here on the 26th and lost his grey-hounds. I had the luck to find them, which I record because the person in whose house they were shut up, though of some consideration in the town, had the impudence, after having tried to make a prize of

¹ The spelling of Spanish and Portuguese names in different maps and books varies so much that it is difficult to be correct, but throughout these pages pains has been taken to be as accurate as possible, in many cases a competent Spanish authority has been consulted.

the dogs, to want payment for their keep; besides which I am fully persuaded that the feast they had had was only at Duke Humphrey's¹ table.

28th February.—Marched into Castel Branco where we found the 4th Dragoons and Sir Stapleton Cotton's staff. We found almost everything to purchase here.

29th February.—Before marching this morning we were seen by Sir S. Cotton, and during the parade I had the misfortune to lose my invaluable dog "Rough." Our route was to Sarnadas, but there not being room for the cavalry and ourselves there, we proceeded to Villa Velha, which I may call the most miserable place in Portugal, no doors to our stables, and our billets hardly to be called covering, the night rainy, and no forage, green or dry, for the horses. . . . I may literally say that my feet as I lay touched the tiles of my apartment. . . . There is a hospital for Portuguese troops in a church here, which when I was at this place before was ruined and empty. I was anxious to get the horses in, and opened the door, when all the cowardly rascals lying sick in their wretched beds, cried out to the sentry to bayonet me. I had not time to draw my sword and did not like to run, so I caught hold of his musket and grappled with him till I had explained that I did not want to put in the horses; he then let me go out with his bayonet close to my breast. I left him next morning, after threatening to cane him, in custody of the militia captain who had charge, who promised he should be punished. No doubt if I could have drawn my sword the rascal would have made off, but being alone and having so many about me, I did not dare to try the experiment.

1st March.—Marched by half brigades this morning at 7 o'clock for Nisa, having the most terrible hill to pass in all Portugal. In crossing the Tagus over the bridge of boats, the river is seen rushing in the grandest style through a cleft in the rocks, which are perpendicular on each side; it is navigable to this spot, and occasionally a depôt is established here. There always has been a Portuguese Engineer in charge of this bridge, with orders to destroy it as occasion may oblige him. He told me that the river had risen so suddenly this year in two days that he could not find boats enough to make the bridge sufficiently long to reach from bank to bank, judging from which the water must have increased at least 20 ft. This gentleman has not however improved the road, so that the march from Villa Velha to Nisa, four leagues, took us from 7 in the morning till 6 in the evening, and the brigade of foot artillery that passed yesterday had their howitzer precipitated over a rock and two wheel horses killed; we were obliged to use ten and twelve horses to one carriage. This is the worst march for artillery in

¹ Humphrey, Duke of Gloucester, son of Henry IV., was renowned for his hospitality, and was a great favourite with the citizens of London. At his murder in 1447, it was reported that a monument would be erected to him in St. Paul's, but he was buried at St. Albans. St. Paul's in those days was a great place of *rendezvous*. When the promenaders left for dinner, the poor who had no dinner before them stayed behind, if asked by the gay sparks whether they were going to dine, they replied, that they would stay a little longer and look for the monument of the good Duke. Thus it became a saying "to dine at Duke Humphrey's table, *i.e.*, to starve, or have no dinner at all." See Halliwell's Dictionary of Archaic and Provincial words, also Brewer's Dictionary of Phrase and Fable.

Portugal, but being prepared it did not give us so much trouble as some we have had.

Bull having halted at Nisa, I dined with him, and met Colonel Elley and Lord E. Somerset.¹

2nd March.—March to Alpalhão. The cultivation here assumes an aspect more indicative of industry, so much so, that I am willing to admit, as an excuse for the country I have hitherto seen, the much greater proportion in which it has suffered from the French. I must still call this side of the Tagus the best cultivated. The town, where we had excellent houses, was different from the usual sort, cleanliness and convenience more consulted, chimneys in every house, and the floors, upstairs and down, neatly paved with brick without any support but the rafters, which are slight and without beams; the rooms are neatly painted, though taste does not hold her reign in these performances. This town will hold 1,000 cavalry.

3rd March.—Shot my way with Colonel Elley to Altar de Chão which was our route. We had excellent quarters, the towns still improving as we go. On our ride we saw several storks, which at Nisa are as domestic as crows in a rookery and perch on the tops of the houses. We passed Crato where there is an extensive pottery, the first manufactory I have seen in Portugal in which the ware is glazed. Crato is calculated to hold 1,100 cavalry, Altar de Chão 1,500, Nisa 1,100, Alkains 800.

4th March.—March to Fronteira, another commodious and clean town, the people and their habitations considerably improved, shops for the sale of linens, etc. Our horses got some chaff here, a seasonable assistant to rye-grass.

5th March.—Marched to Estremoz, which is a spacious and well-built town, with shops and trade of almost every description. Oranges in abundance, ripe and cheap, six and seven for 1½d. This place has been formerly fortified, the walls now stand, but the situation is of too little importance for it to be repaired or garrisoned; the works are weak and ill-constructed. There is a citadel placed in a commanding situation, many convents, etc. It is no less true than remarkable that in the dry weather no water is to be had between this place and Altar de Chão. The cultivation is good, and country productive.

6th March.—Marched through Borba to Villa Vicosá, the end of our long route. Both these towns justify the preference given to this part of Portugal. The 5th Dragoon Guards and part of the 7th division occupy the town with us. Our men and horses are lodged in the palace. Captain Bull's troop is in the castle, looking out of windows up three pair of stairs. Last night some of the horses fell through the ceiling, to the great astonishment of their fellow brutes in the storey below them.

7th March.—Spent my day at the troop stables endeavouring to cure the sore backs of which, in this march, we have more than our share.

8th March.—Went in the morning to see Sir Stapleton Cotton inspect

¹ Lieut.-Colonel 4th Dragoon Guards.

the 5th Dragoon Guards. The condition of their horses far exceeds anything I have seen. It must be observed, however, without wishing to detract from their merits, that they have been lying in idleness at Thomar all the winter, whilst we and others have been on short forage and taking fatiguing marches. Their appointments and discipline, however, sufficiently prove that this good fortune is not the only cause of their present effective state.

9th March.—The two troops, so recently from their march, were to-day drilled by Major Downman preparatory to being seen by Sir S. Cotton; this is a new method of making troops of Horse Artillery effective. After it was over I went to take a more minute view of the castle, which stands as a citadel, and has regular bastions and ravelins, but no guns are mounted. The works and foundations are hewn out of a solid rock and would be difficult to breach, but the whole place is commanded by surrounding heights. From this castle are seen Jurumanha and Olivença, now dismantled, and the walls of the famous royal park of Villa Vicosa, many leagues in circumference, abounding with wild boar and venison, which are forbidden fruit to the army, Lord W.'s orders being very severe on this subject.

10th March.—Dined with Major-General Charles Alten.¹ Reports in circulation of a small party of the enemy being seen by a picquet of the 4th, at Jurumanha.

11th March.—We were reviewed by Major-General Sir Stapleton Cotton, who was pleased to express himself satisfied with our appearance. If he was as much so as I was displeased at our being lugged out with fatigued and thin horses, much to our prejudice, his satisfaction must have been infinite.

12th March.—Great firing supposed to have been heard by General Alten, who rode towards Jurumanha, but could discover nothing.

13th March.—Went to take a more minute view of the castle, anciently intended for the defence of this place but now in a ruinous state; it is useless, being commanded in every direction, but its cells and dungeons deserve to be in the annals of romance. There is an ancient armoury here, but the armour is now lying in a promiscuous heap. I could not help thinking of the Welsh gentleman who spent £500 in establishing his family at the Herald's office and afterwards brought an action against the King-at-Arms for extortion. He might here have procured suits enough for nothing with which to have adorned all his halls in Wales, and established, beyond controversy, the antiquity of his house.

14th March.—The 1st, 6th and 7th divisions marched for Elvas, and farther.

15th March.—The dragoons marched for Olivença, our route is not yet come.

16th March.—Marched to Olivença, five leagues, by a bad road. We crossed the Guadiana at Jurumanha; this place is high and strong and

¹ Commanding 2nd brigade, 7th division.

has a powerful fort for the defence of the passage of the river, which is so deep that a little rain renders it impassable. As there has been a military bridge here, on the opposite side looking over an extensive plain, there is a tête-de-pont, but the work appears to be of little strength and has no guns at present; the guns of Jurumanha ranging over it. The fortifications at Olivença have been breached by us in several places, to prevent a recurrence of what took place last year, when 300 French refused some regiments admission till driven out.

This place might be strong but the situation is unimportant. We expect to remain some days.

17th March.—Received orders at 12 o'clock, when in bed, to be in harness at 5, which is now about half-an-hour before daybreak. We were paraded by that hour with Bull's troop, the 3rd and 4th Dragoons and 5th Dragoon Guards, and marched six leagues, halting at Almandral for the night, having orders to march at daybreak; the cavalry went farther. Conjectures are various about our pushing on so fast.

We are now well in Spain, and the difference in courtesy and cleanliness between the Portuguese and Spaniards is striking. The face of the country too changes, there is more plain and less brushwood and altogether a much better field for cavalry operations. Within a mile of Almandral is the field of Albuera. I regretted that our time would not permit of visiting it, and begin to find that a soldier has no business to set up as able to describe a country.

We were obliged to cut green wheat here for the horses; after we had taken our harness off, the men were in the fields cutting forage when an order came for marching instantaneously, and we were actually only ten minutes before the horses were in the guns; then came a counter order and we remained all night.

18th March.—Marched at 5 o'clock, in a most tremendous rain, and overtook the Dragoons at Santa Martha where only last night 300 French were turned out. We here halted and bade adieu to the cavalry who proceeded onwards, whilst we reported to the 7th division within two leagues at Feria, and are waiting for orders. The second day the horses have had no corn.

General Slade's brigade, the Royals and 3rd Dragoon Guards, came in, in the evening.

19th March.—The 7th division and the Dragoons marched. We remain for orders which we shall receive from General Graham,¹ who commands this large detached force. Some troops marched on to Villa Franca, in the hopes of surprising a magazine there. A seasonable supply of corn arrived.

20th March.—Rain all day. Our men having above a league to go for forage, wheat was cut, no other eatable for the horses being found. Occasional firing heard from Badajos, and various reports in circulation.

21st March.—To my inexpressible joy there arrived for our use this day 17 horses, most of which come to my division; the number of

¹ Afterwards General Lord Lynedoch.

horses that have died in it sufficiently proves that it is absolutely useless to send old horses on this or any other service. Rain all day. The service at Badajos must be exceedingly hard.

22nd March.—Rain all day. Many detachments of sick coming from the front, and many marching to join their regiments. There were at least 300 applications for rations made to us by men who had had none for some days. In this respect the commissariat management is very defective, there being no intermediate place for supply between Badajos and the front, and in these towns, as in all other places in Spain and Portugal, nothing is to be purchased to furnish an Englishman with food. We obliged the Alcalde or magistrate to kill some goats for their use, but this was scarcely worth their acceptance.

23rd March.—Heavy rains. Dyneley's goat was missing and traced to a goatherd's hut where the blood was seen at the door; the servants went and burnt the hut, and carried away a fitch of bacon after giving the man a very handsome castigation.

24th March.—Received a route for Villalva, but went to Azeuchal in consequence of the former place being too full of troops to contain us. Azeuchal is an excellent town, and has more business than any other I have passed through; there are even curtains in the windows, tapestry on the walls, and matting on the floors. The bed I slept in had a counterpane of green flowered satin with broad edging of silver lace and fringe; fleas turned out to be the luxurious inhabitants of it, and they tormented me all night.

25th March.—Early in the morning a man came with an order to march from Captain Macdonald, who had gone on to Villa Franca the night before and with much difficulty persuaded General Graham to allow us to come forward. We started at about 8 o'clock and got to Villa Franca by 4. I regretted very much that my time would not allow of examining the town; there is a fine church and tower, but our order was to proceed to Usagre, which we reached at 10 o'clock, and there found orders to halt 2 hours and push on by the Llerena Road, it being intended to surprise 3500 French in that town. At 12 o'clock, leaving the howitzer and heavy carriages, we marched with only the five six-pounders and overtook General Graham, with the 1st, 6th, and 7th divisions, at half-past two o'clock.

26th March.—At half-past two the army was formed on the Llerena Road in three columns; the right, consisting of the 43rd regiment, was to make a circuit to the right, round the place, and the 7th division light troops were to take the same direction, but to form an inner circle; the centre column, composed of the 1st and 6th divisions, was to enter the town; the cavalry, viz., the 4th, 3rd and 1st Dragoons, and the 3rd and 5th Dragoon Guards, with Bull's troop, under Sir Stapleton Cotton, being on their left flank, whilst all baggage was ordered to stop at Usagre. We were attached to the 1st division and were to force the town and gates. In this order we advanced just before daybreak, sanguine and certain of success. Unfortunately, numbers of led horses and all the staff got to the front, and the enemy's patrol firing, they galloped back

in great confusion, and in such numbers that they were taken for the enemy's cavalry charging and fired at accordingly, by which unfortunate mistake an assistant-surgeon of the 31st, a sergeant, and two men were killed, and a lieutenant and paymaster wounded; but worse than all, the enemy was alarmed and the enterprise frustrated. Our guns came into action by General Graham's order at a dark wall supposed to be an enemy's column; we fired nine rounds before the General would be convinced of his mistake.¹ The cavalry column might have been in time, but the ground did not admit of their pursuing the enemy. Bull fired by order, two or three shots entirely out of range! It is ridiculous that general officers should not be better informed on these subjects. We remained in the fields till 11 o'clock, when we took up our quarters in Llerena, and had the mortification to learn from the Spaniards that the French had no notice of our rapid advance.

27th March.—Marched for Maguilla, where we lay with pickets in sight of the French, who are said to be in force at Guadacanal. Having been two nights without a bed and much fatigued I hoped our baggage would join us this evening, but in this was disappointed. I, however, pulled my clothes off and wrapped myself in my blanket, having a wretched billet. Much firing heard from Badajos, and reports in circulation that General Hill had been engaged.

28th March.—Cavalry and 6th division pushed on in advance, much skirmishing with the enemy, but no particular occurrence.

29th March.—I may call this the first day I have had a little time to spare for thinking, and having my baggage up I wrote to Maurice. Intelligence was received that La Pina, the Spaniard, was in force on this side of Seville with 10,000 men, but the French are collecting their troops, and it is supposed we shall retire.

30th March.—Was sent by order of General Graham to reconnoitre the road from hence to Usagre and to report if there was one to that place between Llera and Valencia de las Torres; this was a ten league job. No new route was to be found, the route by Valencia being the best; there are, however, three, by Higuera, Valencia and Llera.

31st March.—Marched for Usagre in a north-east wind with terrible rain, distance five leagues, which performed, we had to send the horses a league for forage.

We understand here that a person from this place gave the French at Llera intelligence of our rapid movement to surprise them.

1st April.—Marched to Villa Franca. Our billets were to-day splendid; some of the rooms were painted with great taste, chandeliers were suspended in them, and the floors were matted, the style entirely Italian. The beds had counterpanes of satin with lace borders and fringe ornaments, but oh comfort where are you gone?

We saw Lord Wm. Russell² here, who had just been at Elvas. We

¹ Lieutenant-General Sir Thomas Graham left the army in July, 1812, for six months, owing to some disorder in his eyes, which threatened loss of vision of one of them; this circumstance may account for his mistake.—Wellington Despatches, Vol. 9., pp. 267, 273.

² Captain Lord George Wm. Russell, 23rd Light Dragoons.

hear from him that Philippon offered to capitulate at Badajos if he could carry away his 5000 men; he was, however, refused. The breaching batteries had opened, and a small hole big enough to admit three men had been made. It is generally understood that the French will not stand in the breach, but they have made the castle very strong. Lord W., after carrying one of the strongest outposts, sent a flag of truce to say that if a mine was sprung he would destroy the whole garrison. How far this threat will prevent bloodshed I do not know.

2nd April—Marched to Villalba, a town, at this time of the year more calculated for cavalry than any in Spain. The green barley and rye grow in the most luxuriant manner.

There is here the most picturesque castle I have ever seen, but the Spaniards have not arrived at sufficient refinement to have a taste for antiquity, therefore all enquiries as to its history were fruitless. I have generally heard it remarked that the priesthood of this country was the only portion of the population who had enjoyed the benefits of education, but those who thus distinguish them should add—comparatively speaking.

On the towers of the church the storks have built their nests, and on the twigs composing them the sparrows have built theirs, so that a stork's nest is a complete feathered colony, and they live in the greatest amity. This is the first time I have met with anything to remind me of a chimney sweeper, for the storks when inclined to be musical, make a noise with their bills, precisely like that which our black gentry make on May-day with their shovels. On every wall in the castle was written, in French, evidently by Spaniards, "*Vive le Roi d' Angleterre.*" I look on this little circumstance as a true criterion of the patriotic feeling of the people of this place; but it is remarkable that no blessings were invoked for the unfortunate Ferdinand.

3rd April.—Notwithstanding our fancying ourselves settled, a route came for Santa Martha, whither we marched. No forage to be had when we got in.

4th April.—To-day I resolved to give up the idea of being settled even for a moment; for, whilst our horses were gone a league for forage, an order came to march to Torre de Almendral, two leagues. We arrived there in the evening not having an atom of forage. All the infantry is falling back on Albuera, where I suppose we shall make a stand.¹

The house we left at Santa Martha belongs to a most interesting family, a widow and two daughters, who, on seeing the troop retiring, were in the utmost distress, uncertain whether they should go to the mountains or wait the event of the approach of the French. I did all I could to console them, and blushed for my own heart that it had become so familiar with distress that it did not feel so much compassion as it used to do. The old woman, near 80, must make her retreat on foot. It is not usual with all Spaniards to leave the towns on the French entering them.

We have General Graham's orders to visit the position of Albuera,

¹ Soult had approached from the south with a view to raise the siege of Badajos.

and understand the probable points of attack, &c. Captain Macdonald and Newland, with two guns, are gone to Villalba, General Graham's head-quarters.

5th April.—Some of the infantry took up the position of Albuera, some skirmishing having taken place with the cavalry in front; our advance retired to Los Santos. The fire on Badajos is rapid.

6th April.—This day Badajos fell, we took it by storm at 9 o'clock at night, and lost many men.

7th April.—Marched to the camp at Albuera at 3 o'clock in the evening, arriving there too late to choose very good ground; I slept, however, very well in my tent.

8th April.—Rode four leagues to see Badajos and the havoc that had been made there. On the road we crossed the position where Marshal Beresford opposed Soult. The ground which we occupied, "the heights," as they were called, gives very little to call a position, and the rivulet which runs at the foot is likewise an insignificant defence. There is a bridge near the town of Albuera where Soult¹ made a false attack to conceal his real object of turning our line on the right. On the whole I should think there never was a battle fought on more equal terms.

At Albuera, "the allied position was occupied by 30,000 infantry, about 2,000 cavalry, and 38 pieces of artillery, of which 18 were 9-prs., but, the brigade of the 4th division being still absent, the British infantry, the pith and strength of the battle did not amount to 7,000. The French had 50 guns, and about 4,000 veteran cavalry, but only 19,000 chosen infantry, yet being of one nation, obedient to discipline, and animated by one spirit, their excellent composition amply compensated for the inferiority of numbers, and their general's [Marshal Soult] talent was immeasurably greater than his adversary's [Marshal Beresford]. The loss of the allies was nearly 7,000 men, of the French about 8,000." Napier, Vol. 3, pp. 532, 543.

The road to Badajos is the best I have seen and equal to any turnpike in England. The city of Badajos commands the Guadiana, and though its only natural strength is the river on one side and its height on two others, yet it is made by art of considerable importance. Its possession is of consequence to the party that holds it, as it forms a *dépôt* which cannot be surprised. The strong Fort of St. Christoval adds to the strength of the place, and there are two other considerable outworks.

Badajos also commands the important country of Estremadura and the Alemtejo: forming on this side together with Elvas, a barrier to an advance into Portugal, since the two fortresses together contain too many troops to admit of either being passed by an enemy.

The English and Portuguese troops stormed it the night before last, having effected three large breaches from batteries erected under Fort

¹ Duke of Dalmatia, created a marshal in 1804.

Picurena, previously carried by assault. The obstacles to mounting these breaches were to one party the ditch, which is dry, and a piece of water about 4 ft. deep which was passed. To the 4th division, a ravelin opposed itself, which they forced; the light and 4th divisions stormed the breaches three times unsuccessfully; never was so much art used to render a breach formidable. The space on the parapet was filled with chevaux-de-frise made of swords, and the ground was covered with a platform of spikes. Within the breach was erected a false parapet of sand bags, behind which were artillery and musketry. Had that been carried, three lines of entrenchments presented themselves on the *terreplein*, and all along the walls and communications from bastion to bastion, trenches were dug and chevaux-de-frise planted. Every street presented similar obstacles, and to prevent escalade, round the whole circuit of the place (except at the castle which stands very high), the edge of the parapet had a trench to contain infantry supplied with langrage,¹ grenades, and live shells. Things were in this state, and many of the light and 4th divisions slaughtered when Lord Wellington sent an order for the return of the troops; fortunately General Picton had been sent to make a false attack on the castle side, and having converted it into a real one, he was actually in possession when he received Lord W.'s orders, which he answered in pencil briefly, "My Lord I am in possession of the castle."

As soon as it was known on the walls that the castle was scaled, the enemy left their guns in consternation. Two thousand were at length rallied by General Vieland, who attempted in vain to retake the citadel, upon which they laid down their arms and the English troops entered the breaches; part of the 5th division made good their entrance by escalade on another side, but the success is attributed to General Picton.

An officer was sent to the Governor, Philippon,² who had retired to Fort St. Christoval, and after some hesitation he surrendered. Another fort was carried in great style by the Portuguese.³

During the siege our batteries were very little fired into as the enemy wanted ammunition. In what was called the grand magazine, only 42 barrels of powder were found.⁴ The slaughter of the officers and men at the breaches was dreadful, nevertheless our fellows when they entered would not kill a man. Two hours plunder was allowed, but I believe little found. One corporal of the 48th told me that he had got £50 in money, but the fool took his jacket off to go to sleep and a comrade stole it all. The sight of the killed and wounded, all of whom are not now removed, is shocking in the extreme, and the whole air is tainted with the smell. Fortunately the weather is not yet hot enough to produce

¹ Langrage was a kind of grape shot mostly in naval use, it is difficult to understand how it could have been used by infantry unless thrown by hand.

² General of Division, Baron Philippon, for his successful defence of Badajos in April and June, 1811, against Marshal Beresford and Lord Wellington, was promoted from General of Brigade. On this occasion his garrison consisted of 5000 men.

³ The bastion of San Vicente.—*F.A.W.*

⁴ Philippon's store of powder was very inadequate to his wants, and he was very scantily supplied with shells. Napier, Vol. 4, p. 401.

putridity so soon as it will do in a month's time, and yet to judge from the shocking effluvia I should fear a sickness. Philippon is said to have broken his parole from England, on which account Lord Wellington would have no communication with him. A wounded officer whom I saw in the French hospital, said that they felt so secure in the art of their defence that they had no idea of our taking the place. The point at which General Picton entered was 24 feet high; and had it been properly defended we could not have taken it, but the best troops were all at the breach, and those at the castle were few in number and irresolute.

"Five thousand men and officers fell during this siege, and of these, including 700 Portuguese, 3500 had been stricken in the assault, 60 officers and more than 700 men were slain on the spot. The five generals, Kempt, Harvey, Bowes, Colville and Picton were wounded, the first three severely; about 600 men and officers fell in the escalade of San Vincente, as many at the castle, and more than 2000 at the breaches; each division there losing 1200. And how deadly the strife was at that point, may be gathered from this, the 43rd and 52nd Regiments of the light division alone, lost more than the seven regiments of the 3rd division engaged at the castle!

Let any man picture to himself this frightful carnage taking place in a space of less than a hundred square yards. Let him consider that the slain died not all suddenly, nor by one manner of death; that some perished by steel, some by shot, some by water, that some were crushed and mangled by heavy weights, some trampled upon, some dashed to atoms by fiery explosions; that for hours this destruction was endured without shrinking, and that the town was won at last; let any man consider this and he must admit that a British army bears with it an awful power. And false would it be to say that the French were feeble men, for the garrison stood and fought manfully, and with good discipline behaved worthily. Shame there was none on either side. Yet who shall do justice to the bravery of the soldiers? The noble emulation of the officers? Who shall measure out the glory of Ridge,¹ of McLeod,² of Nicholas,³ or of O'Hara⁴ of the 95th, who

¹ Major Henry Ridge, 5th Regiment, already distinguished for his conduct at El Boden, he was killed after the escalade of the castle by the 3rd division.

² Lieutenant-Colonel Charles McLeod, commanding 43rd Regiment, he was killed.

³ The gallantry of Major Wm. Nicholas, R.E., an officer who had already highly distinguished himself in Italy, in Egypt, and especially at the battle of Barossa, was so conspicuous at Badajoz that the particulars deserve to be here recorded.

In the dead of the night preceding that of the assault, he volunteered to reconnoitre the place, and in spite of the risk of discovery by the sentinels and the difficulty of the task, he stripped and forded the inundation of the Revillas brook, to ascertain the safest passage for our columns. The following night he was detailed as Engineer to lead and shew the troops of the advance to the main breach. There, after twice essaying to reach the top he fell, wounded in four places, but notwithstanding the distress in which he lay from these wounds, when he saw the fall of Lieut.-Col. McLeod and Captain James, who were two of his oldest friends and comrades, and when he heard the soldiers demand "Who should lead them to the third onset?" he instantly ordered two of his men to bear him up the breach in their arms. One of his brave supporters was killed, and the same moment he himself received a musket ball, which passed through his chest, breaking two ribs and injuring the spine. This shock precipitated him from the top to the bottom of the breach, and

perished on the breach, at the head of the stormers, and with him nearly all the volunteers for that desperate service? Who shall describe the springing valour of that Portuguese grenadier who was killed, the foremost man at the Santa Maria? or the martial fury of that desperate soldier of the 95th, who, in his resolution to win, thrust himself beneath the chained sword-blades, and there suffered the enemy to dash his head to pieces with the ends of their muskets? Who can sufficiently honour the intrepidity of Walker,⁵ of Shaw,⁶ of Canch,⁷ or the resolution of Ferguson⁸ of the 43rd, who having in former assaults received two deep wounds, was here, with his hurts still open, leading the stormers of his regiment, the third time a volunteer and the third time wounded? Nor would I be understood to select these as prominent, many and signal were the other examples of unbounded devotion, some known, some that will never be known; for in such a tumult much passed unobserved, and often the observers felt themselves ere they could bear testimony to what they saw; but no age, no nation ever sent forth braver troops to battle than those who stormed Badajos.

When the extent of the night's havoc was made known to Lord Wellington, the firmness of his nature gave way for a moment, and the pride of conquest yielded to a passionate burst of grief for the loss of his gallant soldiers.

Now commenced that wild and desperate wickedness, which tarnishes the lustre of the soldiers' heroism. All indeed were not alike, for hundreds risked and many lost their lives in striving to stop the violence, but the madness generally prevailed, and as the worst men were leaders here, all the dreadful passions of human nature were displayed. Shameless rapacity, brutal intemperance, savage lust, cruelty and

there he was further injured by the surging multitude who passed over him as he lay. At last he was carried off, and after his wounds had been dressed he was able to write to his father. For a time it was thought he might survive his injuries, but he had lost so much blood and lain without assistance so long in the terrible confusion of the breach, that it had never been found possible to restore warmth to his limbs, or to overcome the debility that supervened, and he died the eighth day after receiving his wounds. He was buried close to the breach where he so nobly fell, and Lieut.-Colonel Fletcher, his commanding officer, erected on the spot a monument to his memory.

General Sir Thomas Graham on whose staff Major Nicholas had served at Barossa, and to whom he was much attached, in writing home on the occasion of his death, says, "If there can be any consolation to his family and friends for the loss of so valuable a life, it is the reflexion that no soldier ever distinguished himself more."—*See Memoir of Major W. Nicholas, "Royal Military Chronicle,"* February, 1813.

⁴ Major Peter O'Hara.

⁵ General G. Townshend Walker, his wounds were of a most extraordinarily severe nature. "A musket shot cut him across the stomach, grazing the main arteries, which continued oozing for many weeks, hourly threatening hemorrhage. He had also several ribs detached from the breast bone, the result of an explosion. After a long confinement in Badajos he was conveyed in his pallet on mens' shoulders to Lisbon, where he embarked for England and recovered. He rejoined Lord Wellington's army near Pamplona, and was again severely wounded." "Recollections of Badajos," Captain McCarthey, 50th Regiment.

⁶ Lieutenant James Shaw, 43rd Regiment, afterwards Sir James Shaw Kennedy, whose valuable notes on the battle of Waterloo are well known.

⁷ Lieutenant Thomas Canch, 5th Regiment.

⁸ Captain James Ferguson, 43rd Regiment.

murder, shrieks and piteous lamentations, groans, shouts, imprecations, the hissing of fires bursting from the houses, the crushing of doors and windows, and the reports of muskets used in violence, resounded for two days and nights in the streets of Badajos! On the third, when the city was sacked, when the soldiers were exhausted by their own excesses, the tumult rather subsided than was quelled. The wounded men were then looked to, the dead disposed of.”¹ Napier, Vol. 4., p. 431, *et seq.*

Badajos was called by the Romans Pax Augusta,² by the Moors, Badaxos. It was besieged in 1168, by Alfonse Henry, founder of the Portuguese monarchy, to which it was even then considered one of the best barriers, and has always, even in the time of the Romans, been an object of importance, but more so than ever since the foundation of the kingdom of Portugal. The English laid siege to it ineffectually in the war of Succession.

9th April.—In camp.

10th April.—Soult having retired from Villa Franca as soon as he ascertained the fall of Badajos, we advanced to Santa Martha, the cavalry to Los Santos, Villa Franca, etc.

11th April.—Received a most unexpected route back to Olivença. After all our glorious projects I do not much relish it. Halted to-day at Toro de Almendral.

12th April.—We received no orders to march to-day. The rest of the army is breaking up to proceed to the north. Our cavalry having advanced suddenly on the enemy as far as Llerena, the light brigade, 14th, 16th and 12th, being in front were opposed to a considerable force of the enemy. A plan was formed for cutting them off from Llerena, which did not entirely succeed; they were, however, charged while in column of half squadrons by the 5th Dragoon Guards. Our fellows rode at the flanks of the column. Sir Stapleton Cotton, in person, and Colonel Elley, the Adjutant-General, led the regiment and rode in front of the line. We lost 13 killed and 30 wounded, and took 150 prisoners. We killed and wounded great numbers.

Received a route for the north, Marmont having suddenly advanced in that quarter and threatened Ciudad Rodrigo. It rained all day, and we did not get to Elvas till past dark, the distance being very great.

¹ “But the strong desire for glory was, in the British, dashed with a hatred of the citizens on an old grudge, and recent toil and hardship, with much spilling of blood, had made many incredibly savage.” Napier, Vol. 4, p. 419.

“The people, on our passing through from the south, were in a most wretched state, and said that the soldiers had killed 85 inhabitants. I believe 32 was the fact.” Cavalry Officer's Diary, p. 146.

² Corrupted by the Moors into Paxagusta, Baxagus, Badaxos. As one of the keys of Portugal, Badajos has often been a place of importance in war. It was besieged in vain by the Portuguese in 1660, and again by the allies in the Spanish war of Succession in 1705. During the Peninsular war, Badajos was besieged by the French in 1808 and in 1809, and again in 1811, when it surrendered on March 11th to Soult. It was thrice besieged by the English under Wellington: first on the 17th April, 1811, after the conquest of Olivença, when the approach of Soult, to its relief, caused the siege to be raised on the 14th May. Secondly, after the battle of Fuentes de Honor and Albuera, the city was invested from the 27th May to the 10th June, but in vain; the third investment on the 17th March, 1812, ended in its capture on the 6th April.—*F.A.W.*

We found the 7th division encamped and we did the same. Doctor Macdonald and I in the same tent; our men had not foraged their horses till 10 o'clock, fortunately there was no rain in the night.

"After the taking of Badajos, Wellington desired to fight Soult in Andalusia, and his cavalry under Sir Stapleton Cotton overtook and defeated the French horse near Usagre. But obstacles arose which prevented Wellington's following up this success. Among them, the fact that Marshal Marmont, who in obedience to the orders of Napoleon had made a diversion into Northern Portugal on behalf of Badajos and had occupied and ravaged the country in the neighbourhood of Sabugal and Castel Branco, was on the Coa. This obliged the allies to return from the vicinity of Badajos to the north. Marmont was at first inclined to fight, but found it too dangerous from the flooding of the rivers behind him, and finally crossing the Agueda on the 24th April, retired to Salamanca." Napier, Vol. 4., p. 434, *et seq.*

13th April.—Marched to St. Olaia. Raining all day. We found the infantry encamped, but for the sake of our horses our indulgent General, Alten, allowed us corn.

This is a town of little importance.

Elvas appears to be strong, but as we were only encamped near I could form no idea of it. I can easily conceive Fort La Lippe, of which we had a nearer view, to be with reason termed the strongest fort in the world. It stands very high and its guns look into all the approaches. I hope to have some opportunity of taking a nearer view.

14th April.—Rain all day and all last night. We passed on our road to Arronches an unfortunate car-driver dead on the road, and according to the inhuman practice of war stripped; no violence appeared about his body, and I conclude he failed from the inclemency of the weather.

Our men, who have not been dry these two days, and doing very hard work, do not suffer much. Arronches has the remains of a wall, but the place is insignificant and commanded.

15th April.—We marched, still in the rain, to Portalegre, a city of which I had heard so much, that I was disappointed in my expectation of its grandeur; it has this advantage, that the French have not been there, and it is the mart for all commodities on their way to Elvas, imported wines and tea and sugar are to be had. The town is remarkable for its numerous convents. It is an episcopal see and has a cathedral, in which some of the paintings on the altar-piece are very highly coloured, but otherwise destitute of merit.

16th April.—Halted to day and had continual rain. Our men in the alcoves of a convent were little better than in the wet, and we had very bad and scanty forage. Champagne, claret, &c., are to be had here, lump sugar and all sutlers goods, bad linens and cloth; the things are cheaper here than in the north.

17th April.—In a terrible wet day we marched to Alpalhão, into

which we were crammed with the 7th division, six of us with Major Downman at the head in one house. We got good forage here, but the rye is grown too ripe and dry and is of little use for horses; the barley is nearly all used throughout the unfortunate seat of war, and all the recompense given is an order or receipt, which I hope, for the sake of the unfortunate people, will be paid some day or other.

18th April.—Marched to Nisa in the rain and were nearly without forage. I found nothing new to remark here.

19th April.—Halted at Nisa. The weather at length cleared up, and we had time to think of drying ourselves, which I could not boast of having done for some time, as all my jackets and pantaloons had rung the changes, and in this despicable country there is no blazing fire to dry things by, nothing but a wretched substitute of a few embers.

My friends the storks were on the tower as usual.

Received a letter from Eliza, and wrote to Freeman and Walcott.

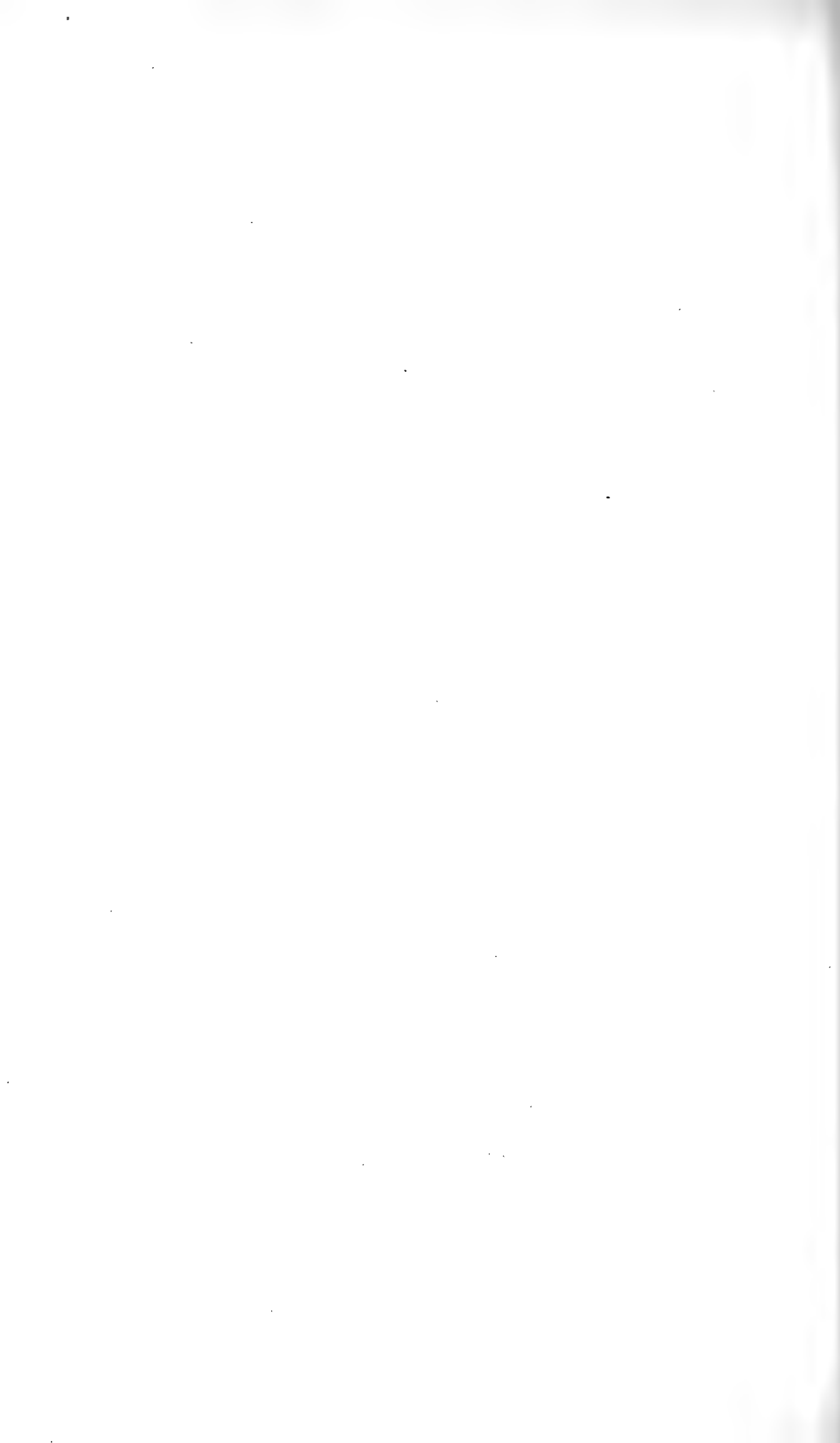
20th April.—Marched on a fine day to Sarnadas where we encamped, having passed the Tagus as usual at Villa Velha.

The commandant of Castel Branco on his retreat from thence to Nisa, after crossing, removed the bridge of boats and got away every man from the hospital; he put in the hands of the convalescents the muskets of the Portuguese Militia rear-guard, who seemed little disposed to behave well.

21st April.—Marched to Castel Branco and contrary to expectation found very little damage had been done; six or seven houses only were burnt, belonging to people who were obnoxious to the French. They now pursue a system according to the bloody policy of their master, only one degree removed from wanton barbarity, which sooner or later will have the desired effect. They destroy the houses of those who desert the towns hitherto the whole populace, but to those who remain they now hold out the promise of leaving their property untouched.

A week before the troop reached Castel Branco, parties of the French force, under Marmont, had plundered the country in its vicinity; however, the Portuguese General, Le Cor, stood fast with the militia, checked the enemy's cavalry detachments, removed the hospitals and some stores, and when menaced by a strong force of infantry on the 12th, destroyed the rest of the magazines, and fell back to Sarnadas, only one short march on the road to Villa Velha, and the next day when the French retired, he followed and harassed their rear. See Napier, Vol. 4., p. 443.

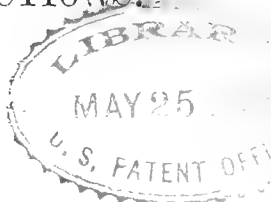
(To be continued).



PROPOSED SLIDE RULES FOR CALCULATING BATTERY COMMANDER'S CORRECTIONS.

BY

MAJOR A. C. HANSARD, R.A.



THE corrections which have to be made by the Battery Commander to the range of a moving object as given by the depression range-finder are :—

- (a) "Error of the day" or "powder error."
- (b) "Correction for length of target."
- (c) "Correction for rise or fall of tide level" (required when using Case II. for laying).
- (d) "Correction for travel of target."

(a) As regards the "powder error" no method as yet proposed will enable us to calculate the correction; the error is partly due to age and condition of the powder charge, which cause changes in the muzzle velocity; and partly to atmospheric causes such as varying temperature, barometric pressure, and direction and force of wind; which influence the resistance offered to the passage of the projectile through the air. Powder error

All that can be said about it is, that it increases with the range (but not usually in any easily ascertained ratio); and if the force of wind is great it may vary with the direction of the target.

(b) The correction for length is necessary from the fact that the depression range-finder takes the range to the bow water-line of an advancing vessel, or stern water-line of a retiring one, and we usually wish to hit the vessel about the centre; therefore something must be added to the range, as given by depression range-finder, to carry the shot to the point we wish to hit; no calculation is however necessary for this. Correction for length of target.

(c) and (d) These errors can be calculated, and in order to eliminate as many causes of inaccurate shooting as possible it seems worth while to calculate them accurately. Tidal error and correction for travel of target.

At present tables are drawn up in which the corrections due to a given change of level, or rate of travel, at certain ranges are given, but if the actual range, state of tide or rate of travel do not coincide with any given in the table, a guess has to be made; and it is impossible to give, as it were, a sufficient number of accurately calculated points, in a table of manageable size, to make this guess-work a matter of no importance. Further the corrections are tabulated to the nearest multiple of 25 yards which introduces another source of error; for if, for Present system.

instance, in a given case each of the corrections ought to be 13 yards, they would each be found in the tables given as 25 yards (13 being nearer to 25 than to zero); and if they are both in the same direction, using the tables a correction of ± 50 yards would be given, the true correction required being ± 26 yards, an avoidable error of 24 yards.

Proposed
system.

By the application of the principle of the Slide Rule these corrections can be made absolutely accurately, or with a margin of error so small as to be practically negligible, and the Slide Rule can be made of a manageable size to give the same amount of information as a very voluminous table. A Slide Rule has already been introduced for Siege Artillery in connection with the Hickman Plotter, and it is believed no difficulty has been experienced in teaching its application to non-commissioned officers.

Tide correc-
tion.

(c) The correction for alteration of tide level is due to the fact that the index plates, multipliers, and hydro-clinometers, are graduated in yards; and when elevation is given by their means to the gun, such elevation refers to the mean tide level; so that if a gun is elevated to a given range by their means the trajectory will pass through a plane at mean tide level at the given range from the gun. (The trajectory will actually pass through a point 7 feet above this level, the index plates &c. being graduated to allow for this; but this does not affect the question of corrections). If the sea level has risen or fallen from the mean, the trajectory, with the same elevation as before, will cut the new plane at a less or greater distance from the gun; and if it is desired to hit an object at the same distance as before, it is obvious that the trajectory and consequently the elevation must be raised or lowered.

The angular difference in elevation is easily calculated but is of no practical use, since the index plates &c. are graduated in yards. What is required is the elevation in yards on the index plate at which the gun must be laid in order that the trajectory may cut the new plane at the required range. This can be directly ascertained as follows:—

A table of (angular) quadrant elevations, corresponding to given ranges is made out for the mean height; and a similar table for the height at extreme change of tide level; then comparing the two the range in yards at the mean height, which has the same angular elevation as the required range at the new height, can be ascertained.

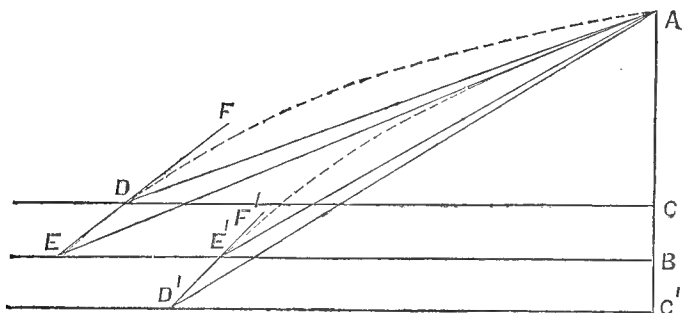
For instance a 9-in. R.M.L. gun is at a mean height of 300 feet, the tide has risen 20 feet, range to object 2000 yards.

The elevation (quadrant) for a range of 2000 yards at a height of 280 feet is 22.5 minutes and this elevation would give a range of 2059.5 yards at a height of 300 feet. Therefore the gun must be elevated to 2059.5 yards on the index plate to hit an object 2000 yards off when the tide has risen 20 feet, in other words a correction of + 59.5 yards must be given.

For less changes of level the corrections are very nearly proportional, so that for a rise of 10 feet the correction would be 29.5 yards. This method however can only be applied with accuracy to voluminous tables, probably quite unsuited to practical purposes. There is however a simpler method, by which a formula can be used to give the

correction, which formula is suitable to the construction of a Slide Rule.

FIG. 1.



In the figure AB is the mean height, BC the change in tide level, AD the range to the object and FDE is a tangent to the trajectory at D .

The trajectory which passes through D may be taken as reaching the mean level BE at E , since for the small distance DE it will not vary sensibly from its tangent; therefore the problem is to ascertain the range AE ; for it is evident that a gun at A , laid by an index plate graduated for the height AB , must be given the elevation for the range AE if the trajectory is to pass through D .

Let $AB = H$, $BC = h$, $AD = R$, and $AE = R + r$; all these quantities being measured in yards; r will then be the correction required.

Now the angle $DEB = FDC$ (angle of arrival¹) $FDC = FDA$ (angle of descent) + ADC (angle of depression).

Let angle of descent = w , and the angle of depression = β_1' , then

$$DEB = w + \beta_1, \text{ and } \beta_1 = \sin^{-1} \frac{H - h}{R}.$$

Now it is obvious that, practically, the error will be very small if we take $AE = AD + DE$; since CB is usually very small compared to CD . Therefore correction will equal DE .

$$\text{Now } DE = BC \operatorname{cosec} DEB$$

$$\text{i.e. } r = h \operatorname{cosec} (\beta_1 + w)$$

also if the tide level has fallen to $D'C'$

$$r = -h \operatorname{cosec} (\beta_2 + w)$$

$$\text{where } \beta_2 = \sin^{-1} \frac{H + h}{R}$$

By taking a mean value for β

$$\text{viz: } \beta = \sin^{-1} \frac{H}{R}$$

we obtain a mean value for either rise or fall of tide; and unless h is

¹ The angle of arrival (a term first used I believe by Lieut.-Colonel Jocelyn, R.A.) is the angle made by a tangent to the trajectory and the surface of the water; and is made up of the angle of descent as given in the range table, and the angle of depression. This is the same thing as the "angle of descent" as defined in the drill-book, but there being no convenient term for the range table angle of descent, I have preferred to use the term "angle of arrival" as above, keeping angle of descent to mean, range table angle of descent.

very large in comparison with H this will not introduce any appreciable error.

The formula for calculating the error then will be

$$r = \pm h \operatorname{cosec} (\beta + w)$$

This may be written

$$r = \pm \frac{h}{\sin (\beta + w)}$$

and $\log r = \pm \{ \log h - \log \sin (\beta + w) \}$

and this is a form suitable for solution by means of a Slide Rule. (It should be noted that there is a case where this formula is not suitable, viz: where the mean height is small the rise of tide large and the angle of descent great for under these conditions the assumption on which it is founded viz: that $AE = AD + DE$ is no longer approximately true).

On the left of the rule, above the slide, is a scale of logs of numbers from 1.67 to 16.67, the figures however are multiplied by 3, so that they read from 5 to 50, this being necessary as heights are always given in feet. Below the slide is a similar scale of logarithms but numbered naturally, as it is intended to read yards. Both these scales are measured from the same point so that 10 on the lower will be found directly under 30 on the upper. On the centre of the slide is a scale of log sines, commencing from the black arrow, but as the angle of arrival will hardly ever fall outside the limits of 1° to 15° , only the divisions between those limits are shown. This scale is not used for finding the corrections, but is put on to enable the scale on the top edge of the slide to be completed for each particular case, as of course it will vary according to the nature of gun and mean height above sea level. To complete this scale then, for a particular case, we have to ascertain the angles of arrival for different ranges (at intervals of 500 yards would usually be sufficient); this is done by taking the angles of descent from the range table and adding to them the angles of depression.

For example:—

Gun M.V.	9" R.M.L. 1440 f.s.	Height above mean sea level 100 feet.	
Range yards.	Angle of descent.*	Angle of depression.	Angle of arrival.
1000	$1^\circ 35'$	$1^\circ 54'$	$3^\circ 29'$
1500	$2^\circ 34'$	$1^\circ 16'$	$3^\circ 50'$
2000	$3^\circ 45'$	$57'$	$4^\circ 42'$
2500	$5^\circ 7'$	$46'$	$5^\circ 53'$
3000	$6^\circ 35'$	$38'$	$7^\circ 13'$
3500	$8^\circ 10'$	$33'$	$8^\circ 43'$
4000	$9^\circ 50'$	$29'$	$10^\circ 19'$
4500	$11^\circ 40'$	$26'$	$12^\circ 6'$
5000	$13^\circ 41'$	$23'$	$14^\circ 4'$

* From range table.

Now to complete the scale, on the upper edge of the slide, opposite

$3^{\circ} 29'$ on the scale of log sines, make a mark and number it 1000; against $3^{\circ} 50'$ put 1500 and so on; also filling in on the right end of the slide the nature of gun, muzzle velocity, and height for which the scale has been constructed.

To use the rule.

Find by the depression range-finder how much the tide has risen or fallen from the mean; set the mark, corresponding to the range of the target, on the upper edge of the slide against the number of feet rise or fall; under the black arrow will be found the correction required. Use of rule.

For instance if the tide has risen 15 feet, and the range is 2000 yards, bring 2000 on slide under 15 on the rule and under the arrow will be found 62, which is the required correction and must be added since the tide has risen.

(d) Correction for travel.

This correction is the allowance that has to be made for the alteration in range which takes place during the time that elapses between the moment of reading out the range and the arrival of the shot at the object. This time is made up of a constant "time of firing," viz.: the time from reading the range to firing the guns, and a variable time of flight. Correction for travel of object.

The amount of correction necessary is ascertained in the following manner: the time in which the range alters by 50 yards is noted, then since we know the range and consequently the time of flight, and the time of firing; we have the following proportion—

$$n : a + t :: 50 : x$$

where n is the number of seconds the range takes to alter by 50 yards, a is the constant time of firing, t the time of flight, and x the required correction,

hence
$$x = \frac{50 (a + t)}{n}$$

and $\log x = \log 50 + \log (a + t) - \log n$.

On the upper part of this rule in the centre is a black arrow marked 50, representing $\log 50$ measured from a point on the left; below the slide is a scale of logs from 10 to 250, which scale starts from the same point, so that the two fifties are exactly opposite one another. On the top edge of the slide is a scale of logs from 2 to 25 marked "seconds;" and on the lower edge is a scale of ranges which must be made out separately for each gun and for each time of firing. The method of constructing it is as follows:— Description of rule.

Ascertain the constant "time of firing" and add to it the times of flight for the different ranges; for example—

Gun 9-pr. R.M.L. M.V. 1440 f.s.	
Range.	Time of flight.
1000 yards	$2\frac{1}{4}$ seconds
1500 "	$3\frac{1}{2}$ "
2000 "	$4\frac{3}{4}$ "
&c.	&c.

If the constant "time of firing" has been found to be 3 seconds

when using Case II. for laying we have to allow for travel at

1000 yards	$5\frac{1}{4}$ seconds	
1500 "	$6\frac{1}{2}$ "	
2000 "	$7\frac{3}{4}$ "	and so on.

Therefore under $5\frac{1}{4}$ seconds make a mark at the lower edge and number it 1000, another under $6\frac{1}{2}$ numbered 1500 and so on.

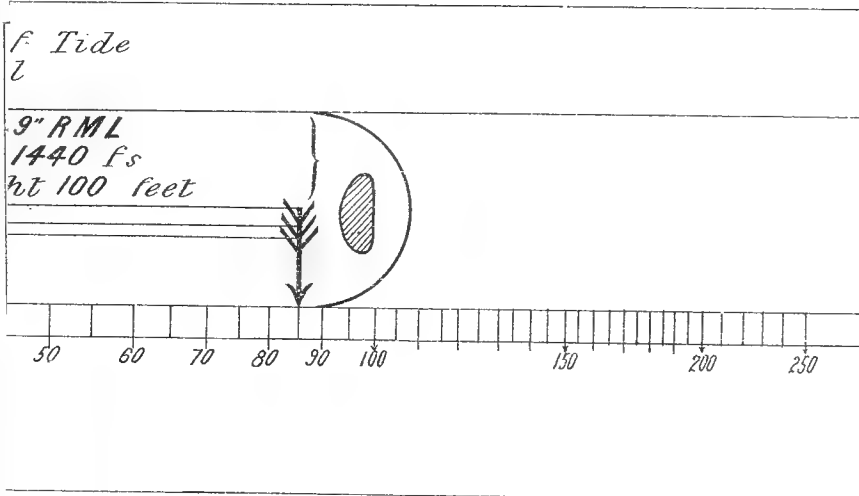
Use of the
rule.

To use the rule bring the division on the scale of seconds, which corresponds with the number of seconds during which the range alters by 50 yards, under the black arrow, then under the range will be found the required correction.

For example, supposing the range to be increasing by 50 yards every $7\frac{1}{4}$ seconds and the range to the target to be 3500 yards. Bring $7\frac{1}{4}$ on the scale of seconds under the black arrow, and under 3500 on the scale of ranges, we find 84 which is the correction required.

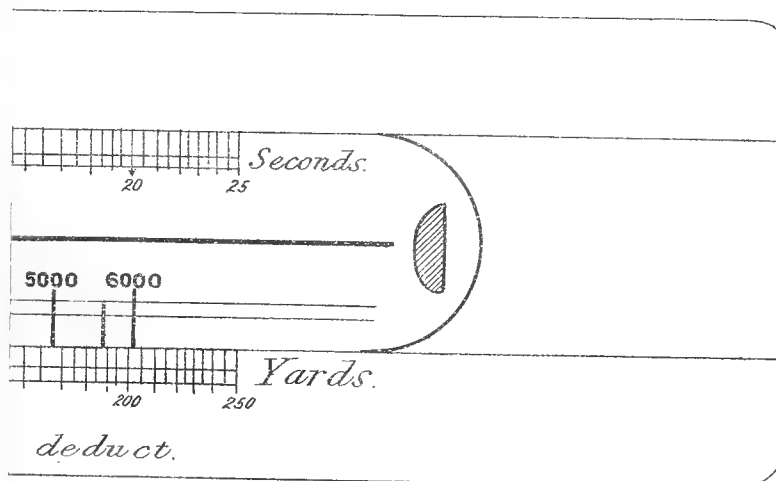
When using Case I. for laying the "time of firing" will be different to that for Case II.; the slide is therefore made reversible so that the scale for Case I. can be placed on one side and that for Case II. on the other.

CORRECTION.



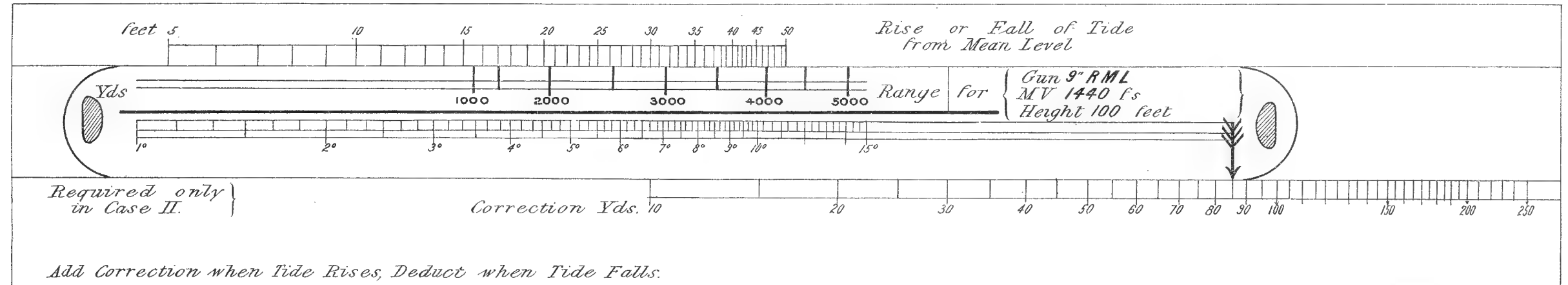
Completed according to local requirements.

N.



SLIDE RULE FOR CALCULATING TIDE CORRECTION.

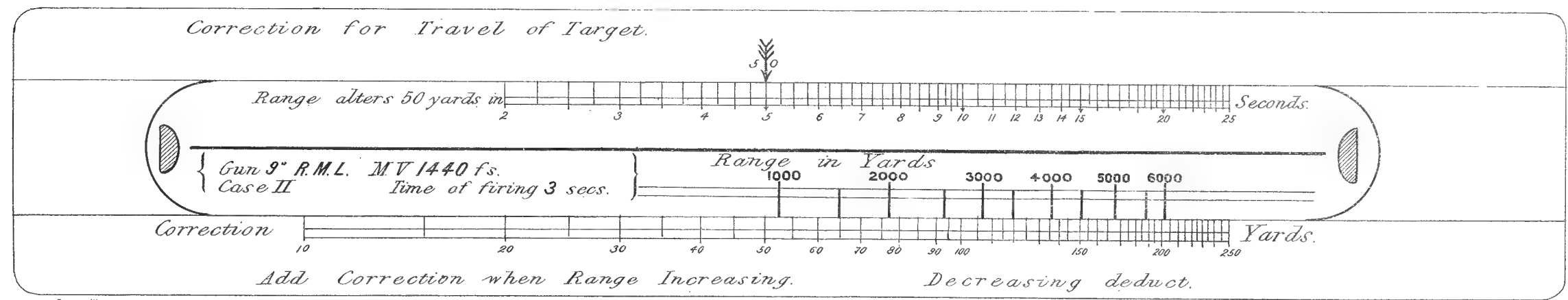
FIG. 2. (FULL SIZE)

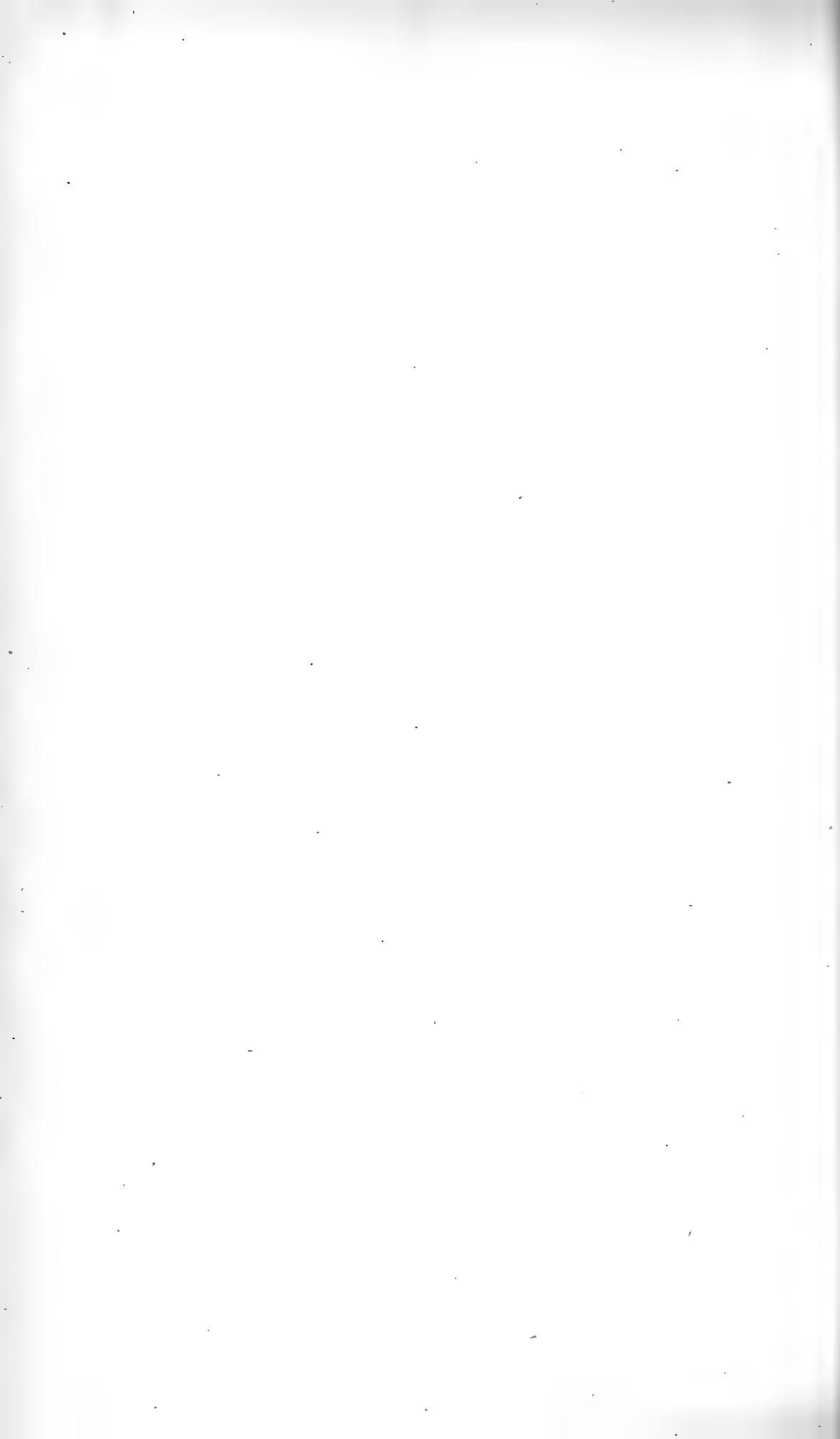


NOTE.—The heavy figures & Scale show that part of the slide which would have to be completed according to local requirements.

SLIDE RULE FOR TRAVEL CORRECTION.

FIG. 3. (FULL SIZE)





CO-OPERATION BETWEEN GUNS AND CAVALRY.

BY

MAJOR E. S. MAY, R.A.

(A Lecture¹ delivered at the Royal Artillery Institution, Woolwich, 7th March, 1895).

LIEUT.-GENERAL SIR EVELYN WOOD, V.C., G.C.B., SPECIAL HONORARY MEMBER R.A.I.,
IN THE CHAIR.

THE CHAIRMAN—I need scarcely introduce Major May to you. I will not say that you know him very much better than I do, because not only do I know him very well but I have a great regard for him. But if I do not know him better than you do I am quite certain that he knows the subject before us better than I do ; and without saying more I will ask him to deliver his lecture.

MAJOR E. S. MAY—Sir Evelyn Wood, My Lord, Sir Redvers Buller, and Gentlemen, it will scarcely be possible for me, in the time at our disposal this evening, to adequately deal with all the opportunities which war may yield to guns and horsemen. The potentialities of the two arms together in making long and rapid marches, in raids, pursuits, or retreats have not long ago been dealt with in previous lectures, and by no one more ably, if he will let me say so, than by the Inspector-General of Cavalry² himself, who has done us the honour of coming here to-night (applause). Great and important as they are I can perhaps therefore now pass them lightly over, to dwell more fully on the more difficult operations which the brigade or division of cavalry may be called upon to undertake, either on the battlefield itself, or when acting independently. Such operations too as we saw the other day near Churn will probably most attract us just at present, and moreover a special difficulty seems to me to cling round them in these latter days which renders discussion desirable. Because now-a-days we are especially tempted to try and combine and fuse together two great principles of tactics which are more or less antagonistic the one to the other. We endeavour to make what for the time being is one unit act by both fire and shock at the same moment, yet can never thus hope to reap the fullest effects from both methods. Nay more we desire at one phase of the action to see men forgetful of the advantages with which modern science has endowed them, and fight as in the days

¹ The lecture was given extempore.

² In a lecture before the Military Society of Ireland, on the 24th of April, 1893.

of flint-locks, and at another earlier stage we may require them to utilize almost to the utmost all the powers of the scientific weapons with which they are equipped.

And our difficulties are further complicated by the fact that in the decisive combat the capability of one part of our unit has not altered very materially during the last hundred-and-twenty years, while that the other portion has grown out of all recognition.

The lance and sword were the weapons of chivalry and are still those on which a cavalry soldier relies when he flings the gauntlet down to his foe for a combat *à l'outrance*.

They are no more deadly now than they ever were, nor are the men who wield them presumably more powerful or skilful in handling them than were those that Seydlitz or Ziethen led. It is a very different matter however where fire-arms are concerned. If Byng's or Maitland's Guards could be called upon to-day to fight the battalions Lord Methuen commands in London we know to a certainty that a mere massacre would ensue. If Ross's troop of 1815 were to engage its successor, "the Chestnut troop" of our own times, we have no doubt that it would be swept away before it could get near enough to put in a round at all. We could prove all this to demonstration, but here certainty ends; and, although we believe, or at any rate I believe, that our cavalry now are to-day, regiment for regiment the best in Europe, I suggest to you that if the Union Brigade, which swept down on D'Erlon's Corps on a certain 18th of June eighty years ago, had to charge the three magnificent regiments which are in England now, the result would be by no means the same foregone conclusion as in the other cases which I have cited. Indeed I myself often doubt (and I know I am supported by opinion in Germany) whether the highly trained squadrons of Seydlitz, "jammed," as he loved to see them "boot to boot," would not be at least equal to any cavalry which modern Europe can show. The principles which govern shock tactics have in fact not altered since before the days of gunpowder, and yet in close alliance with them we have to utilize weapons which would astonish such comparatively modern Generals as Lord Raglan or Lee. I use the word "have" because it is remarkable how strong a tendency there is, and has always been, on the part of cavalry to avail themselves of fire, even at the expense of velocity, and yet it is a fundamental truth that its only hope lies in swift movement and cold steel (applause). From Cromwell's time to Frederick's the tendency prevailed. The latter set to work to stamp it out, and succeeded. But in spite of his teaching the heresy seems still to smoulder. To mention a few examples that I have come across while looking up this subject lately. I find the French cavalry halting to receive our charge with pistol-fire at the affair of Aroya-Molinos in 1811;¹ the Russian cavalry halting and firing with a brigade moving straight against them in 1854.² The Austrian horsemen, reputed to be the best in Europe at that time, doing exactly the same thing on at least two occasions in 1866,³ and

¹ October 28th. "History of King's German Legion," Vol. II., p. 23.

² At Balaclava.

³ *Vide* official account of the war of 1866, pages 95 and 344.

there is an even more remarkable example still. We all know how splendidly the French cavalry fought on occasions in 1870, and what devotion and courage they displayed when assailing infantry in particular, yet had they so little of the true cavalry spirit, that, when that gallant and celebrated charge was delivered by Marguerittes division on the Illy plateau at Sedan it was preceded by volleys of carbine fire. So much was this the case—so much smoke and explosion of firearms was there—that an eye-witness has told us that the German 5th Corps at first supposed that they had infantry in front of them.¹

British cavalry, gentlemen, have never been prone to such a fault, if they have erred at all, they have done so on the side of a too headlong valour, but nevertheless I say these chance examples remind us once more of the need which cavalry feels for the support of fire, and of the truth of Napoleon's dictum "Cavalry has more need of artillery than infantry, because it cannot reply to fire but can fight only with the steel."

But if artillery is to be the right arm, as it has been termed, of cavalry, it must be trained weekly or even daily with it, and the two should, if possible, learn to understand one another, not from the perfunctory study of one another's text-books, but from that personal familiarity which is acquired to some extent at field days, but is fostered and developed in a far larger degree, by life together in camp and barracks. (applause). And I dwell particularly on this point because owing to the changes in the armament of artillery which I have alluded to, there is an especial danger that Horse Artillery may now-a-days receive an one-sided education only.

The power of the modern Horse Artillery gun is such that batteries cannot be allowed to stand idle during a great battle, and therefore modern Horse Artillery batteries, whatever may have been necessary in the past, must be trained and utilized in precisely the same manner as are field batteries; and they constitute in fact simply mobile Field Artillery. If expense and forage considerations were of no moment it would indeed be better to have all gunners mounted, and thus ease the horses. Mobility is the most vital characteristic which artillery should possess, and, leaving its use with the cavalry division altogether out of sight for a moment, it is in this respect that Horse Artillery is always valuable (loud applause). In a former lecture I spoke myself on this part of the subject, and quoted modern instance in support of what I said, and I do not wish to enlarge on it now—there is no time for me to do so—for the truth is as old as the hills, but I cannot help reminding you that at Dresden Napoleon had to double the teams which could not draw his guns by taking horses from the commissariat wagons. At La Rothiere the artillery of Sacken's Corps could not be got forward, and one-half had to be left on the ridge of Trannes, while all the horses took on the other half, and came back for the remainder. After Montmirail the Russian artillery could only be got off the field by harnessing 50 Hussars with long ropes to each gun. At Vauchamps when Grouchy got across Blacker's line of retreat with

¹ I found this statement in a series of "Lectures on the three arms," by Baron Seddeler of the Russian General Staff, published in the "Militär Wochenblatt" in the year 1873.

his cuirassiers all the accounts tell us that not a man would have escaped had the Horse Artillery not been delayed by the execrable state of the roads.¹ We have seen the same thing happen with us not thirteen years ago in spite of these experiences, and of an hundred similar ones, and we would do well to bear in mind that mobility is the first essential to artillery, that we do not make war on grassy lawns, or only in summer weather, that horses lose their strength when underfed and overworked (loud applause). And, so far as we can read the future, it seems probable that harder work than ever will be asked for from Horse Artillery. Because, as I have said, it now has to fulfil two rôles; one as Horse Artillery with the cavalry, sometimes acting quite independently, and the other, a more frequent one perhaps, when it takes its place with rest of the Field Artillery in line of battle, what in fact for want of a better term we may call its rôle as "Corps Artillery."

With the advanced cavalry, when merely feeling for the enemy, it will not have to fight decisive actions, for its duty will be to furnish just enough force to rend the hostile veil, and it can utilize its range often here, yet will have to do a lot of hard work in moving rapidly over long distances. But it may have severe fighting too even with the advanced cavalry, for it may be sent to seize some important strategic point as after Tel-el-kebir in 1882, or as when the 5th German Cavalry division (Rheinhabens) went ahead to seize the passage across the Moselle in 1870; to make a raid on the line of hostile communications, as when the Horse Artillery and cavalry of the 1st army—Prince Frederick Charles's dashed on and cut the line of rail at Lundenberg;² or to fasten on and hold fast an enemy endeavouring to escape, as at Vionville. All this may have to be done before the opposing bodies of infantry and Field Artillery see one another at all, and, when a pitched battle is joined, the labours of the cavalry and Horse Artillery will be by no means lessened. For these two must work together then with the other arms, and must watch eagerly for every chance which may enable them to operate for the common good. And while awaiting an opportunity the Horse Artillery, be it remembered, will probably take the same share in the action as do the other guns. Finally the duties of cavalry and Horse Artillery in retreat or pursuit will demand an immense expense of energy, but we have no time now to do more than just refer to them, or I would like to tell you of the wonderful retreat from Quatre Bras to Waterloo, "the prettiest field day of cavalry and Horse Artillery I ever saw in my life," as Lord Anglesey termed it, when the 7th Hussars greatly distinguished themselves. But I know I may ask you to spare me a moment to say that the Captain Fraser, who handled a troop of that regiment so well that day, was the father of the Inspector-General of Cavalry, and of Sir Charles Fraser, whom we all regard as perhaps the best friend the Horse Artillery ever had (loud applause).

¹ "Il n'aurait pas sauvé un seul homme si le Général Couin, qui avait ordre de suivre le Comte Grouchy, avait pu arriver assez tôt avec deux batteries d'artillerie légère; de chemins presque impraticables i'en empêcherent." "Victoires et conquêtes," Vol. XXIII., p. 97.

² July 15th, 1866.

There are indeed, as I have said, only two phases of this many sided usefulness that I propose to speak of this evening, one when cavalry and Horse Artillery are called upon to throw their weight suddenly into the scale at some crisis in a pitched battle, and the other when a cavalry brigade or division for the time being independent engages a similar hostile body in a decisive combat.

The latter is the kind of fight that will perhaps most fascinate cavalry soldiers, and there is certainly more room in it for the display of those peculiar qualities with which a leader of Horse should be endowed, but the opportunities afforded on the battlefield itself, come, perhaps, more frequently, and it is in them that cavalry and guns may show themselves especially useful. We will all willingly do homage to the chivalrous impatience which urges a fiery Hotspur against his natural foe irrespective of surrounding circumstances, but we will esteem him more, if he intervenes only when the interests of the rest of the army call out his skill or courage (applause).

So vastly important indeed does this co-operation of cavalry and guns on the battlefield seem to me to be that I desire to give it the first place in discussion this evening.

The actual tactics to be adopted depend so greatly on the conditions of the moment, on the proximity or otherwise of infantry, on the state of the hostile troops to be assailed, that I need not dwell just now upon them, but will only say that the distinguishing characteristic of the two arms is to be utilized as far as may be, and that the flanks and communications of the enemy should be sought when possible.

Of modern instances of such co-operation there are not many; the cavalry and artillery work in 1866 was not quite satisfactory, and in 1870 the French squadrons were admittedly mismanaged. There was a great cavalry combat certainly on the 16th of August, 1870, at Ville Sur Yron to the north-west of Mars-la-Tour, but before it took place the German Horse Artillery had been absorbed in the general fight, and no guns supported Barby's charges. There is also a very good example of what Horse Artillery and cavalry can do in modern war, even on the battlefield itself, to be found in the story of the battle of Loigny-Poupry in December of the same year, but I have dealt with that in previous lectures, and I don't want to repeat myself to-night. And so, gentlemen, I will ask you to come back with me all the way to 1811.

Some may despise my example as a shred of ancient history, but I believe it is the spirit rather than the letter which we should dwell upon with reference to the particular part of the subject in our immediate view, and that the old wars may still be studied with advantage.

The special characteristics of cavalry and the mode of their application have not altered at all since the stirring times when the century was young, and guns must co-operate in the future and utilize their mobility just as they did in the past. I say further that, if you want to read of Horse Artillery and cavalry at their very best, you must refer to what those arms did in that wonderful campaign of 1814 in France, when Napoleon showed the world what genius may accomplish against

appalling odds. At Rheims¹, to give one instance out of many, he turned the left flank of the Russians, under St. Priest with 8000 cavalry and 30 Horse Artillery guns. But the allies retaliated in the most brilliant manner at the second battle of Fere Champenoise,² when 20,000 of their horsemen with 128 guns utterly defeated the corps of Marmont and Mortier, 22,000 strong, of whom 17,000 were infantry, and with 84 guns. I think this is perhaps the most astonishing achievement of guns and cavalry which history records, for not a musket was fired on the allied side, and gunners and troopers worked entirely alone (applause).

From India too may be gleaned splendid illustrations of the value of Horse Artillery and cavalry, of their powers in covering long distances, or carrying through gallant enterprises. India moreover, as I may remind you, has even a claim to be regarded as the birthplace of the former arm. However that may be, it is at any rate certain that we cannot anywhere find mention of brighter exploits than those of which our Indian Horse Artillery can boast, and I know my brother officers will bear out my assertion, that, when future historians may undertake to collect the names, which have shed most lustre on our regiment, it is to the muster rolls of the Bengal Artillery that they will most frequently have to turn (loud applause).

But in India we have not had to fight an European foe with our Horse Artillery, and I therefore resort this evening to one of the great battles of the Peninsular war for an illustration. There no doubt have been deeds accomplished on a larger scale, such as those I have mentioned from 1814, but nowhere was the danger more imminent, or the crisis sharper than at the battle of Albuera.

It will be impossible I fear to analyse it very closely for the records on the subject are singularly bald. They did not publish official accounts in those days and the great authority, Napier, was an infantry soldier, and I think he has sometimes failed to do full justice to the cavalry and artillery. We know from the glowing pages, which tell the story of "the fatal hill," "with what a strength and majesty the British soldier fights." "That astonishing infantry" surely deserved every word he said of them and more, but it is disappointing nevertheless to find the equally gallant efforts of the 3rd and 4th Dragoon Guards, who with four guns of "D" troop held our right flank against the efforts of the powerful French cavalry, but comparatively briefly referred to (applause).

Let us stay for a moment to see what they did; but I will only speak very generally of the operations except in so far as they affected the cavalry and Horse Artillery.

Beresford on the 16th of May had taken up a position at Albuera to receive Soult who was marching to the relief of Badajoz. The Spaniards were on his right, the English in the centre, the Portuguese on his left. The cavalry and Horse Artillery were extended along his front, their left appuyed on the village of Albuera. On the high

¹ March 15th, 1814.

² March 24th, 1814.

ground above the village the four guns of "D" troop¹, R.H.A., under the command of Captain Lefebure were in action.

The whole force under Beresford amounted to about 27,000 infantry, of whom only about 7500 however were British, 2000 cavalry, and 38 guns. Against these Soult brought some 20,000 veteran infantry, 4500 cavalry, and 52 guns, authorities differ as to the exact numbers but these are near the mark. Beresford had neglected to occupy a wooded hill on his right front between the Ferdia and Albuera rivers. Behind this hill Soult accordingly massed his heavy cavalry under Latour Maubourg, and his 5th Corps, while he made a feint of attacking the bridge leading across the stream to Albuera with the remainder. Between 8 and 9 o'clock Alten's Light Infantry Brigade of the King's German Legion, which was holding the village and bridge of Albuera, was assailed, and a sharp contest ensued. But it was soon evident that the real attack was to be on our right, for two-thirds of the French infantry were seen to counter-march to their left, while their light cavalry wheeled about too, and galloped rapidly up the left bank of the Albuera to join the remainder of their horse in an attempt to outflank and overwhelm our right.

The Spaniards were ordered to change front to the right, the second division was moved to their support, while the Portuguese were carried to the centre, with the exception of one brigade which was sent to support Alten. The 13th Light Dragoons were left above the bridge, but Lumley's heavy brigade, consisting of the 3rd and 4th Dragoon Guards and the Horse Artillery battery, was hurried as fast as possible to the extreme right to cover our flank, which was much exposed, and was being threatened by heavy masses of French cavalry and artillery.

The Spanish General was both obstinate and incapable, his troops failed to carry out the orders they had received as promptly as they should have done, and the French were upon them ere they had completed the necessary movements. In half-an-hour Beresford's position was a desperate one, and defeat or victory hung in the balance till the very end of the battle. The complete story of that fight must be studied elsewhere. It is enough to say now that the duties which were thrust on the cavalry and guns on the right, where some very hard fighting took place, were as arduous as perhaps fell to the lot of any of the troops. Again and again did Soult throw squadron after squadron upon them, and often were they all but overwhelmed. "D" troop was ridden through several times by the enemy's horsemen and for a short period they gained possession of one of its guns. It was however soon recovered and Lumley was able to hold the inundation back until Hardinge's inspiration saved the day, and the celebrated charge of the Fusiliers pushed Soult's columns down "the fatal hill" (applause).

But before that crowning stroke, let me remind you that the fate of the day had already been snatched out of the fire by Lumley's promptness, and the courage and devotion of four of his heavy squadrons, who fell on the French Hussars and Polish Lancers in the moment of their triumph. Four of these regiments had suddenly caught Colborne's Bri-

¹ Two guns had been left behind at Lisbon, and had not yet joined.

gade and Cleeve's and Hawker's guns at a disadvantage in the rain and mist, had taken them in flank and rear, had slain or captured two-thirds of the brigade and six of the guns, and had penetrated through to every part of our position. Beresford himself had a hand-to-hand encounter with a Polish Lancer, and owed his life to his great personal strength and courage.

One of Colborne's battalions however stood firmly on the heights, and our cavalry were at hand in the hour of need. Never in fact did the three arms more loyally co-operate than at this crisis. There have been bigger battles, but none I think more glorious to our soldiers (applause).

I wish I could give closer details, but I have found that to try and find particulars of some of these glorious actions of the great wars is a most hopeless and disappointing task. The regimental records of the 3rd and 4th Dragoon Guards dismiss deeds that should be cherished by every man in their ranks in a few niggardly lines. The artillery despatch was lost, and we have only some private letters from some of the officers engaged to go upon. But the good service done by the cavalry and guns is recognised handsomely, if too briefly for the students' needs, by everyone who has written of that day. Marshal Beresford's despatch was most flattering to the artillery, and so was that of General Lumley, while Brigadier-General Long¹ who commanded our light cavalry writes in a private letter :—"The dispersion of our cavalry scarcely left us 400 or 500 British at any point, and these with two regiments of Spaniards, were all we had to offer by way of resistance to their numerous and overwhelming columns. The ground however favoured us, and the Horse Artillery did its duty with brilliant effect. The enemy lost a great number of men, and from 400 to 500 horses by the operation of this arm alone." Consider what a loss of 400 or 500 horses means to a cavalry division on active service ! I think you will agree with me that to inflict such a loss as that under the circumstances argues well for the coolness and courage of the gunners (loud applause).

And now, gentlemen, is there no lesson to be drawn from this ancient history? May not guns and cavalry be called upon in the future to play just the same part in which their predecessors distinguished themselves in those far off days? Can we ensure genius on the part of our generals now any more than we could then, and under similar conditions of leadership and atmosphere might not precisely the same incidents once more recur? A dull man and a rainy day ! Is the combination an absolutely remote contingency even in this nineteenth century? If not, then I say, a weak flank may once more have to be protected against the inroad of an overbearing foe, British infantry and guns may again be surprised and ridden over by an active cavalry, and the vigilance and readiness of the same arm may again be indispensable if disaster is to be retrieved (loud applause).

Nine days afterwards there was a brilliant little cavalry fight at Usagre when Lumley with his two fine regiments, Madden's Portuguese,

¹ Extract from a letter of Brigadier-General R. B. Long, from "Bivouac near Vicente," dated the 26th June, 1811.

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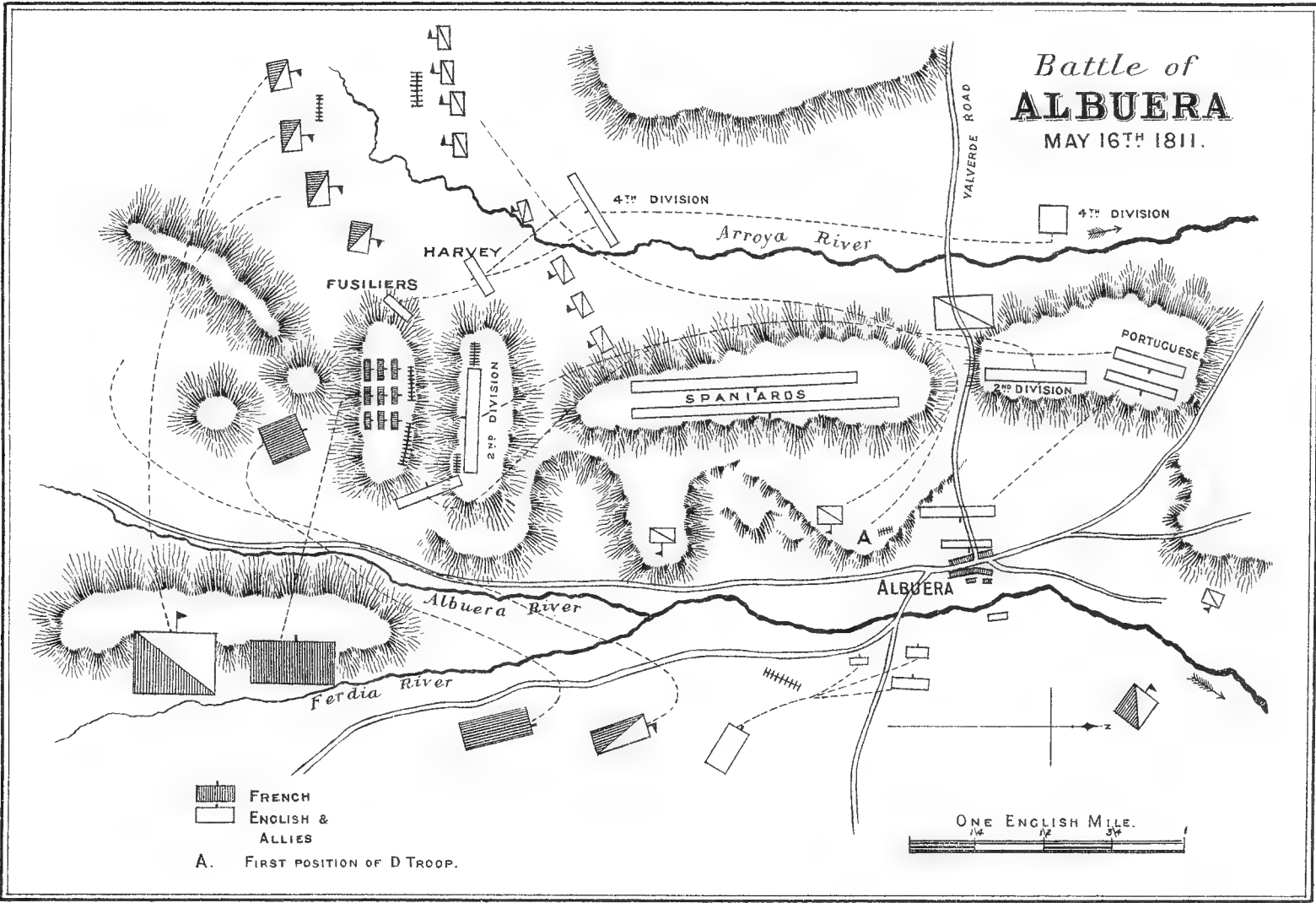


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and "D" troop, was attacked by Latour Maubourg with the whole of his cavalry division and some guns. The French were driven off with a loss of 200 men for, as a letter from an officer engaged says cheerfully, "the instant our jolly fellows came near them, they turned and were sabred in good style." I cannot pause now to tell you more of that fight however, nor of Ribera,¹ where the services of "D" troop were again especially brilliant, and probably no man ever received a higher tribute than did Captain E. C. Whinyates who was its second captain. But I may just mention that during a communication after the action under a flag of truce the French leader, General Lallemand, made particular enquiries for the name of the officer who had commanded the guns near the river, and on learning it sent the following message to Captain Whinyates. "Tell that brave man that, if it had not been for him, I should have beaten your cavalry, but that meeting me in every movement with his fire, he never would allow me to form for attack. Say that I shall mention his name in my orders as having been the cause of our defeat, and not your cavalry. Be sure you tell him this. Promise to give him my message" ² (applause).

There are other actions too gentlemen, of which I could tell you, in which our cavalry and guns loyally played into one another's hands, but I must leave myself time to dwell on perhaps the most splendid deed of all as far as cavalry is concerned, and one of which I have found it possible to get minute details. It is very far indeed from being an ideal cavalry and artillery battle planned and fought out according as theory directs and with odds on both sides equal. I can assure you it is almost impossible to find such. There is nearly always something abnormal which spoils the symmetry of the fight. One side or other is supported by infantry, or fights with smooth-bored cannon against rifled ones, or there are no guns present, or one party declines the combat just at the interesting moment. However I believe there is more than one lesson in the story I am going to tell you, and so I will ask you to bear with me even if I relate a drama played out, as in war is nearly always the case, scarcely in a way to satisfy rigid and exacting critics.

But before I go any further into this the most difficult and important portion of the subject I want to put it to you with all the cogency I can command, that now Horse Artillery and cavalry leaders alike must forget some of the lessons they have acquired when studying the Corps Artillery side of Horse Artillery training. There is no time now for deliberation, every shot must tell; the artillery leader will often have to act on his own responsibility; there must be the most complete and thorough understanding between the two arms. Owing to the natural wish to get the most out of their armament I believe we have trained our Horse Artillery batteries too much lately with a view only to the Corps Artillery side of their usefulness. On the other hand they have done so well at Okehampton that cavalry soldiers are fascinated by the accounts of their destructive powers at comparatively long ranges. I

¹ 24th July, 1812.

² *Vide* History of "C" Battery, p. 64.

venture to think that matters want clearing up a little, and therefore before I say any more I will be bold enough to put one or two propositions before you which I regard as vital.

When guns and cavalry are engaging one another in decisive combats—

- (a) Ranges should be decisive. That is to say of not more than 1500 yards, if possible, and on an emergency considerably less (applause).
- (b) Speaking generally, but recognising the principle that the arm at the moment most dangerous is the one to attack, the objective of both cavalry and guns is the hostile cavalry.
- (c) Changes of position are to be avoided, and as a rule one decisive position only is to be taken up until the cavalry combat has been decided.
- (d) The officer commanding the artillery is on occasions to take the initiative, should be separated from the cavalry leader, and not hang back waiting for orders (applause).

It may sound startling to some ears to hear a doctrine as to ranges advanced which sacrifices so completely the powers of the gun. For a short time other views held the field, but now I think the pendulum is tending to swing the other way, and almost all authorities recognise the fact that decisive ranges must be sought, otherwise at a critical moment the fire of the guns may be masked, their moral effect will not be so great as it otherwise might be, and the two arms will not work so completely together as they ought. Moreover the cavalry fight develops with such rapidity that we want every round to be effective, and finally considerations as to the supply of ammunition make us chary of wasting even one. Under such circumstances, and when we do not intend to enter into a protracted contest with guns at all, cover is to be left out of our calculation and we should think only of so placing ourselves that we may have the best chance of quickly injuring our opponents, and may move off again rapidly if necessary.¹ It is for these reasons that the limbers are put close behind the guns, and that we place them so without misgivings in the face of all we know as to the deadliness of the modern shrapnel shell.

Changes of position are to be avoided because they waste precious moments.

Let us now see, gentlemen, how matters are likely to work out a little in detail.

Two divisions or brigades each accompanied in the former case by two or three batteries, and in the latter by one, are in contact and mean to fight. The country is one suitable for the working of the arms, and

¹ A note from the Diary of Lieutenant Swabey in the Peninsula throws an interesting light on this subject:—

“Apropos of Captain Lefebure, remember in coming into action, when cavalry is likely to come up unperceived, not to let the limbers of the guns turn, or drive farther from the trail than to admit of the gun being worked without the handspike.” See R.A.I. “Proceedings,” p. 93, Vol. XXII.

for the moment infantry may be left out of our calculations. What is the first thing that will occur after the news that the enemy is close by has been received? The cavalry will be formed in a formation preparatory to attack. How long will it be before the division is ready to move forward? I suppose perhaps sometimes as much as twenty minutes, but I speak with diffidence in the presence of so many high authorities on cavalry. Now during that time it may well happen that the hostile batteries will come into action, and will try and cannonade the squadrons while more or less stationary. I said just now that Horse Artillery were to go to decisive ranges, but the hostile cavalry are probably not in sight, as yet we are only in a preliminary stage of the combat, and the guns must cover the deployment of their friends if it is interfered with by fire. Therefore they will usually now have to engage the hostile batteries. But remember they are not to do so in the same spirit in which they act when they are working as Corps Artillery. They are to be prepared to move off rapidly again when their friends are ready, and are never to be drawn into a protracted artillery duel. And the same rule, it may be as well to point out, applies to any other occasions during the earlier part of the action when collisions between advanced or rear-guards—little squalls that skim before the storm—may draw fire from the guns (applause).

By the time the three lines are formed the hostile cavalry will probably be in view, our leader will move forward to reconnoitre, the officer commanding the artillery will accompany him, and the guns will be left on the protected flank moving a little in rear of the first line.

All the guns should be held usually together in one mass. They will thus accomplish most by their fire, and will interfere least with the free movement of the cavalry.

Bear in mind, gentlemen, that events now are rushing on with bewildering variation and rapidity. The two hostile bodies are closing on one another as active cavalry only in an open country can move. There is not much time to think, and none for alteration of plans. Our leader will quickly form his decision, choose the position for the guns (aided in his choice by the artillery commander), and will send him to take command of his arm either at once or at any rate when the trails touch the ground. In very many cases the position selected will be the rising ground from which the reconnaissance is made. Often it will be a favourable site nearer to the foe. I have heard the question as to whether the guns should advance *straight* forward or move slightly to a flank hotly argued. Let us waste no time over such contentions or pedantries. In nine cases out of ten on the actual field there is only one place which is obviously the best for artillery, and the guns will go to that place whether it be a little on the flank or not. But the *ideal* move for them is nevertheless straight to the front, because thus they will get to work quickest, and never forget that in combats such as we are now discussing the artillery have at first to make a race of it to forestall that of the enemy.

Again however I must add a saving clause such as all rules in war demand. The cavalry is the principal arm, the predominant partner in the union of which I am now speaking, and the artillery must not for-

get that it is purely an auxiliary. Therefore the worst fault a gunner could commit would be to interfere with the free movement of the squadrons, or hamper their effective action. If circumstances demand that the cavalry go straight to the front, then the guns must get out of their way to a flank, and they must always be careful that by no chance should they incline *towards* the cavalry during their advance. The bias if any should be in the other direction (applause).

Moreover another reason for guns going straight ahead is that nothing decisive is ever accomplished in a cavalry action except by flank attacks.

The squadrons work away from the guns therefore to gain the enemy's flank. He changes front to face them, and in doing so not only offers a chance of enfilade fire to our batteries, but at the same time masks his own.

"That is all very well," some one will say, "but what are the enemy about all this time?" Certainly, gentlemen, I am only spinning a pretty theory. Nevertheless such is the consummation we hope to reach by our manœuvre, and all we can ever do in war is to try and act correctly ourselves and trust that our foe will make more errors than we will. It is only a question of who makes the most numerous and gross blunders after all, and in seeking perfection for ourselves we need not seek it for the foe also (applause).

When the guns do move into the decisive position they are to go at their best pace.

If more than one battery is engaged it will be best to place the batteries in *échelon*, the one furthest from the fight being in advance. Each battery can thus change front on a central gun easily, and fire be turned quickly in the different directions which a moving target may necessitate.

How far to the front can they go without undue rashness?

The general rule says that they should advance one-third of the distance which separates the opposing forces. They ought however almost always to have an escort and then they are safe enough as long as they keep nearer to their friends than to their foes.

An escort will protect them from enterprises on the part of small hostile bodies, and, if the main body of the enemy fall upon them, it will be doing the very thing I have said it should not do. Its cohesion will be broken up, and it will pay dearly for its blunder, if our cavalry are at all decently handled.

Meanwhile the batteries, even if they are ridden through, will be comparatively little injured.

I think the text-books have exhausted the subject of fire discipline.

But now after the first collision there comes a phase of the fight when I think the guns most often in actual war have got their chance.

When we read the story of cavalry combats we find that they have often ended in but "a lame and impotent conclusion." The first lines meet, there is some cutting and hacking, one side begins to yield, then the second lines come up, the fight sways back again, and so on, what Lord Anglesey in one of his letters calls a "see-saw" supervenes, and finally perhaps both sides end by finding themselves much in the

positions from which they started. What give really decisive results are flank attacks, or artillery fire into squadrons which are attempting to rally. It is therefore to shatter a foe finally who otherwise might recover himself that guns must strive, and it is by doing so that they will frequently be of great service. They did good work thus at Benevento in 1808, and again, as I shall presently show you in 1854. Therefore during the combat of the cavalry the officer commanding the artillery should keep a watchful eye on the course of events, and be ready to send his guns, or, if he has three batteries in hand, a portion of them, galloping boldly on after the enemy's squadrons, to give them that knock down blow that will prevent their showing a front again that day. If the success is a very pronounced one he will also go rapidly on with all his force, to pursue with fire the flying enemy.

In the event of a defeat he must act as circumstances dictate, but it will almost always be best to remain doggedly in position, and fight his guns to the very last. To limber up and try and get away before a pursuing cavalry is I believe an hopeless effort. I have read an account by a foreign officer who says no one who has never had actual experience can realize what a panic is apt to seize men then, how quickly the avenging horsemen seem to gain upon you, and how helpless you feel with your back turned to them.

On the other hand you will find an account of how a Prussian battery breasted the torrent, and turned it by its fire, in the story of the fight at Rossbrunn during the campaign in Western Germany in 1866 (applause).

And as a concluding word on tactics I want further to lay it down as a general principle that, though the Horse Artillery are to assist in every way the cavalry, still the latter is to attack when that one golden moment, which occurs once only in a fight, and once lost is never perhaps regained, offers an opportunity, whether the guns have prepared the way or not. Here in fact the relations between guns and cavalry, differs absolutely from those between them and infantry. I have heard, I am sorry to say, bigoted artillerymen propound other views, and assert that the cavalry must wait for the batteries to produce their effect. Never! If the guns can act, all the better, but *never* miss a chance through any pedantic scruple as to waiting for them to do so (applause).

And now, gentlemen, I will tell you something of the charge of our heavy brigade at Balaclava, and try and get a few practical lessons out of it.

It is rash of me I know to speak of the Crimea to this audience. Sir Evelyn saw this fight, and so did Sir William Stirling, and moreover Sir William served shortly afterwards in this very troop of which I am going to speak, and he knows more of Horse Artillery on active service than any man in our army now living (loud applause). But rash as it is, I want to speak of this fight to-night.

I desire before I say anything however to make my intention perfectly clear. I have not come here to glorify my arm, nor to write a glowing epitaph for a man whom I never saw, and who died indeed, poor fellow,

a few years after the Crimean war was over.¹ The glory of the heavy charge at Balaclava belongs to our cavalry alone. Not a shot, not a shell, was fired by any Horse Artillery gun,² until the Russians were fairly in retreat, they were beaten by the pluck and dash of our Dragoons, and by nothing else, and I in no sense wish to claim any share of one of the most brilliant feats of history for the Horse Artillerymen (loud applause). But *after* the foe was first turned back, they did some service too, and we can learn something from their conduct. The reason however why I selected this as an example to discuss was because I have been able to get close information with regard to it from two absolutely reliable sources. I regret I cannot further indicate them. One from Russia, for obvious reasons, it is better to keep secret. The other is supplied by a man who is as modest as he was brave and capable when in the service and he wishes his name not to appear (applause).

Now I will briefly tell you so much of the story of the day as concerns us this evening.

Seeing the Turks giving way in the Gorge of Kadikoi, here (pointing to the diagram) Lord Raglan sent 8 squadrons of our heavy brigade to their assistance. General Scarlett was in the act of executing this mission and had with him the 5th Dragoon Guards, the Scots Greys, and the Inniskilling Dragoons, in all six squadrons, while two squadrons of the 4th Dragoon Guards were following him, and two of the Royals joined him later. The six squadrons in front had got into two columns owing to an obstruction in their path, and of these the right hand column was led by the 1st squadron of the Inniskillings and closed by the two squadrons of the 5th Dragoon Guards, and the one on the left hand by the 2nd squadron of the Inniskillings and closed by two squadrons of the Greys. No patrols or scouts covered the march of these troops. Suddenly the head of an immense Russian column of cavalry, composed of probably not less than 2000 men, is seen crowning the causeway heights on our left flank not more than seven or eight hundred yards away. Scarlett on the left flank of our left column determined at once to attack them, and wheeled the three squadrons beside him into line to the left, the other three forming the right hand column were wheeled to face the enemy too, and constituted what was practically a second line. The 1st squadron of the Inniskillings had gained on the others during the march, and was formed therefore to their right rear.

¹ Captain Brandling died of consumption at Leeds, 16th April, 1860.

² I somewhat accentuated the fact that "C" Troop did not fire on the Russian cavalry until they were in retreat, because I did not wish it to be supposed that I at all wanted to minimise the splendid achievement of our Dragoons. Since I gave the lecture I have had evidence before me, and especially letters from General Sir Robert Biddulph, G.C.M.G., C.B., R.A., who was with Barker's Battery near Kadikoi on the day in question, which shows clearly that that battery did fire at the Russian cavalry column, which attacked Scarlett, before the collision took place. As to the value of that fire I need not now open a discussion; for it does not affect my point, which is to show that it was Brandling's clear insight and decision which prevented the Russians from rallying or making a second charge, nor my contention that, had arrangements and equipment been better considered, the Horse Artillery would have been in their proper place in sufficient time to have had a glorious chance at the huge target the Russian column would have offered them just before our men fell upon it.

The three squadrons in front numbered some 300 men, those in rear not quite as many more. The two squadrons of the 4th Dragoon Guards, and of the Royal Dragoons were meanwhile moving on to support. Now there is nothing more gallant, or more creditable in the whole of military history than the manner in which this handful of men behind Scarlett dauntlessly faced and attacked an enemy immensely superior to them in numbers, and moving against them with all the advantage of the ground in their favour. But we cannot pause to dwell on the details even of so glorious a feat. We want to look into the artillery side of the action, and a battery was hurrying up to try and find a place in the impending combat.

"C" Troop had been quartered with and attached to the light division, and had that morning been called from its camp, five-and-a-half miles away. Why, you will ask, was not the troop with the cavalry? Why indeed! Except that during the Peninsular war Ross's troop—The Chestnut Troop—had been and made its reputation, not with cavalry, but with Craufurd's celebrated light division. There were only two troops of Horse Artillery in the Crimea, "I" and "C;" of these, "I" had been allotted to the cavalry, and was now with the light brigade, and "C," as I have said, was with the light division. Far better had it been had another Peninsular precedent been followed; for Lord Paget, as he then was, had command of a cavalry division of five regiments and two Horse Artillery batteries during Sir John Moore's campaign in 1808.¹

But the fault of not keeping the Horse Artillery with the cavalry was in 1854 further aggravated in spite of what experience taught by arming "C" Troop with four 9-prs. and two 24-pr. howitzers. An equipment too heavy for Horse Artillery.² A rough road and an unwieldy equipment destroyed the chance the guns had of effectively co-operating. As an eye-witness tells us, the horses "reeled and trembled," when they halted after the excessive strain, and after all the troop arrived a few minutes too late.

As it came down from the upland past the Col, this way (pointing to the map) the troop was met about here by a staff officer with a message from General Fox Strangways (remember him, gentlemen, he had fought with the Rocket Troop at Leipzig, was wounded at Waterloo and was killed at Inkerman), calling it to a certain spot on the left of the heavies. "C" Troop was then commanded by Captain John Brandling, a man who seems to me, from what I have heard of his behaviour

¹ The 7th, 10th, and 18th Hussars, the 15th Light Dragoons, and the 3rd Light Dragoons of the K.G.L., with "B" and "C" Troops, R.H.A.

² The 9-pr. equipment armament of "C" Troop in 1854, weighed, gun, 38 cwt. 29 qrs., waggon, (without spare wheel), 34 cwt. 1 qr. 17 lbs.

6-pr. equipment armament of "I" Troop 28 cwt. 23 lbs., waggon, 33 cwt. 3 qrs. 8 lbs.

24-pr. Howitzers for 9-pr. equipment, 39 cwt. 1 qr. 11 lbs., waggon, 35 cwt. 1 qr. 20 lbs.

12-pr. Howitzers for 6-pr. equipment, 29 cwt. 17 lbs., waggon, 31 cwt. 2 qrs. 13 lbs.

No men on limbers or elsewhere have been included in these weights which have been kindly obtained for me by Col. F. A. Whinyates.

The weight of the 12 pr. B.L. and limber is 39 cwt. 3 qrs. 9 lbs. "with personal equipment and detachment." *Vide Handbook of 1893.*

on this day, to have had a readiness, resolution, and coolness in action such as mark him out as a man endowed with something akin to genius for war. I don't want to spatter him with indiscriminate praise, as one wise after the event might possibly do. Some of you who study art will remember how when Turner was informed of the subtleties and meanings, which most people failed to appreciate, that Ruskin had discovered in his pictures, he laughed and said, "Ruskin sees a good deal more in them than ever I put there!" Brandling similarly may have acted as much by good luck as good guidance; but it is fair at any rate to give him credit for the latter. And he saw that since the order for him had been given the situation had materially altered. The Russian column was now moving on and seconds were precious. He saw at once that he could not possibly reach the position suggested in time to be of any use. Therefore without any hesitation or delay he shouted "No, I cannot get there in time," or words to that effect, and he drove straight on this way by the rear of the Dragoons. Now I say he acted then with the independence that a Horse Artilleryman should show, and he decided moreover most judiciously. Because in order to get the fullest effect, both from fire and shock, it is best to strike the hostile cavalry on the flank furthest from the guns. The enemy, if he then faces your onset, exposes a flank to the artillery, which is able to fire upon him not only up to the very moment of collision, but is able to pursue him with shells as he retreats. Now there were two squadrons of the Royals and two of the 4th Dragoon Guards which might fall on the Russian right. Therefore when Brandling went where he did, he seized a position from whence his fire was not likely to be masked, from whence he might hope to assail most effectively his objective during the combat, and from whence he might pursue it most vigorously with fire should it fall back towards its base. But above all, and that was the consideration we may be sure which most influenced him, he went where he could most quickly get into action (applause).

So he drove along with his left shoulder turned to the backs of our Dragoons. But all the time watching closely, mark you, the state of the situation. When in rear of our line (somewhere about here) he saw the huge column rolling on down the slope, and he noted what might look something like hesitation and delay in our first line, for the 1st squadron of the Greys was advancing alone to the attack. It seemed to him that in all probability the mere inertia of the Russian mass would bear our men back. He determined therefore to go somewhat to the rear so as to cover our retreat. So he called out "sub-divisions right wheel," but he himself remained where he was with his eyes turned on the impending collision. Thus he saw the devoted charge of the 1st squadron, and the rest of the three hundred moving off too, and their inroad into the enemy's ranks. He saw from the way the Russians bore themselves at that supreme moment that they were not going to ride us down, and then he determined to throw his lot in decisively, not to avert defeat, but to achieve victory (applause). He shouted "sub-divisions left wheel," and brought his troop up on the right rear of our squadrons. But ere he could get in a round his front was masked by the first squadron of the Inniskillings which now crossed him to dash in on the

Russian left. On the other flank the 4th Dragoon Guards, and the Royals were now no less vigorously pressing, while the 5th Dragoon Guards were storming in to the left rear of the Greys. What takes some time to tell was in reality but a matter of minutes, and soon the monstrous column was more or less disintegrated, and retired up the slope.

And now Brandling at last got his chance.

The moment he saw which way the tide of battle was setting he sprang forward, and even while a few red-coats were still tinging with colour the dull grey mass, he was at work. The column was so large that its very weight held it together and its rear and left rear could not be reached by our swordsmen. It was not therefore completely scattered, but rather rolled itself sullenly back, and on the high ground behind the Russian officers were soon seen holding up their swords and rallying their men. Kinglake says that the troop of Horse Artillery now "fired a few rounds." Gentlemen, I can tell you exactly what it fired. From the first position it fired five rounds per gun, and four per howitzer into the Russians, and from the *échelon* position twenty-one rounds more. The first range was about 800 yards, and the fire was most effective, not only morally, but physically. General Godman, who was adjutant to the 5th Dragoon Guards on that day, writes, "I well remember the troop of Horse Artillery firing into the retreating mass almost before some of the red-coats were clear of them, and going over the ground next day I saw they did good work."

And from a Russian source testimony as to the effect of the shells has also reached me through the kindness of Colonel F. A. Whinyates, whose loss to the regiment we still deplore, and who has devoted so much time and trouble to the history of the troop, which he commanded for ten years with such marked distinction (loud applause).

The artillery fire effectually put an end to any chance of rallying which the Russians may have ever had, and they now quickly retired. A Russian driver and a pair of horses were found killed at this time by the explosion of a shell on the ground over which the great mass had moved, and this has given rise to the notion that there may have been some guns with our opponents. The driver may however have belonged to something else than a gun, and certainly no artillery worked with the cavalry on the Russian side.

The troop now limbered up, went ahead again, then changed front to the right, and came under fire from some guns near No. 2 Redoubt. It then advanced by *échelon* of half batteries in the direction of some Russian squadrons which were pushed out against it. The left half troop came into action against these, and its fire was most effective, visibly so indeed, and compelled them quickly to withdraw. The heavy brigade were covering the troop three or four hundred yards in rear of it during this time. We cannot to-day, gentlemen, follow Brandling's movements further, and his work with the heavy brigade now practically came to an end, but I hope I have said enough to show that he acted in a way in which we would wish gunners to act when assisting cavalry, that he utilized all the chances he got, that he showed himself quick,

resolute, knowledgeable and bold, that in one word, he behaved like a good soldier¹ (applause).

¹ With reference to my remarks as to the good service done by Brandling's battery I think the following letter which I received from Lieut.-General Sir Charles Craufurd Fraser, K.C.B., will be of interest :—

Cavalry Club, London,
22nd March, 1895.

SIR—Had the opportunity occurred of my entering into discussion after your lecture, I should have supported your account of the good work done by the Royal Horse Artillery at Balaklava, by quoting the following words from a letter that I received, at the time of the reduction of the Horse Artillery, from Colonel Frank Forster, who took part in the successful charge of the heavy cavalry as a captain in the 4th R.I. Dragoon Guards :—“ If there are any officers alive who were in John Brandling's troop of Horse Artillery at Balaklava, they would tell you how his opportune arrival with his guns after the heavy brigade charge, saved them from a fresh attack, from a very strong force of Russian cavalry. If your Horse Artillery is reduced, your cavalry becomes more feeble than ever.”

Further on March 18th, 1895, he writes :—“ John Brandling's troop was not attached to the heavy brigade and was sent down from the front (on the hill opposite Sebastopol) to assist the cavalry, when it was seen that an engagement with the Russians was imminent.

The distance he had to come was about six miles—he did it as fast as he could go—and only arrived in time to open fire on a supporting force of Russian cavalry.

He told me that the horses in his troop were so beat from the pace he had come, he could not have got them much further.

They had been worked hard and badly fed ever since they had landed in the Crimea.

I see they are going to increase the Royal Horse Artillery again, what a triumph to you and the others who opposed their reduction.”

Yours faithfully,

CHARLES CRAUFURD FRASER,
Lieut.-General.

To

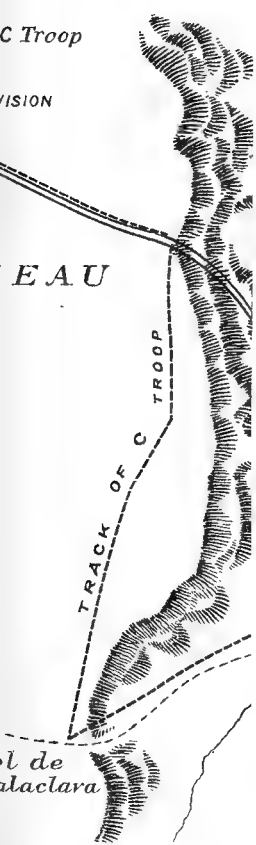
MAJOR E. S. MAY,
Professor of Military Topography,
Royal Military Academy, Woolwich.

Colonel F. A. Whinyates has since my lecture kindly sent me the following reminiscences of Captain John Brandling, supplied by one who served as a non-commissioned officer with him in “C” Troop during the Crimean war, which I publish as they may interest some of his old friends :—

At the Alma the first retirement was at a rapid pace, and Brandling, who remained well behind next the Russians, swore lustily, “D—n it! where are you leading to, keep this shoulder up, the other shoulder up, etc., etc.” At the second retirement the troop had lost a man, and Colonel Lake his horse, and Baddeley, who had surrendered his to the Colonel, was running about with a saddle in his arms, Brandling joking him, though things looked very warm. Just before wheeling about again to advance, Captain Strange came down, and asked Brandling where he was to take the waggons to. Brandling roared out at the top of his voice smiling all the while, “wherever you like Captain Strange;” repeating it three times; he then ordered the Trumpeter to sound “About” and “Gallop,” looking as happy as if he were going in at football. There was many a laugh over this afterwards, and together with the swearing at the previous retirement, and his remaining in the open under fire after putting all he could under cover at the river side, gave the men a great opinion of his coolness in battle; but there was a strong feeling with all ranks that as the troop was actually in the field before the enemy, the command as the fortune of war, ought to have been allowed to devolve on the senior Lieutenant (the late Major-General E. J. Michell) who was a highly efficient officer, instead of handing it over to one who was not a *bond fide* Horse Artilleryman. (Brandling had been transferred from the siege train).

Brandling was a north countryman and after explaining things frequently used the expression “You know.” On the morning of quitting the Alma he called the Nos. 1 to the front and told them to impress on the men not to get out of the way of the shot when in action, or to use the words “look-out” to each other when the shot were coming at them, adding in his own style, and with a touch of drollery in his eye, “if a shot is coming to take your head off, you know, it is not a d—d bit of use trying to get out of its way, you know, now I saw that the other day and I don't want to see it again.” This sort of thing went down with the men and helped to enliven them in their subsequent hardships. It had reference to the Bulganac, when the mounted detachments received their *Baptême de feu* as cavalry, and found how trying it is to sit still in one long rank and be shot at by artillery; there was a little easing off and opening of the files, and thus many shots passed through harmlessly. At the Alma the shots were far too numerous to admit of being seen.

At page 138 “History of ‘C’ Troop” mention is made of a shot coming close over his shoulder, his back was toward the Russians at the moment, and the guns were in the act of wheeling towards him in column of sub-divisions. A N.-C. officer called “Look out Sir,” as the shot seemed to be



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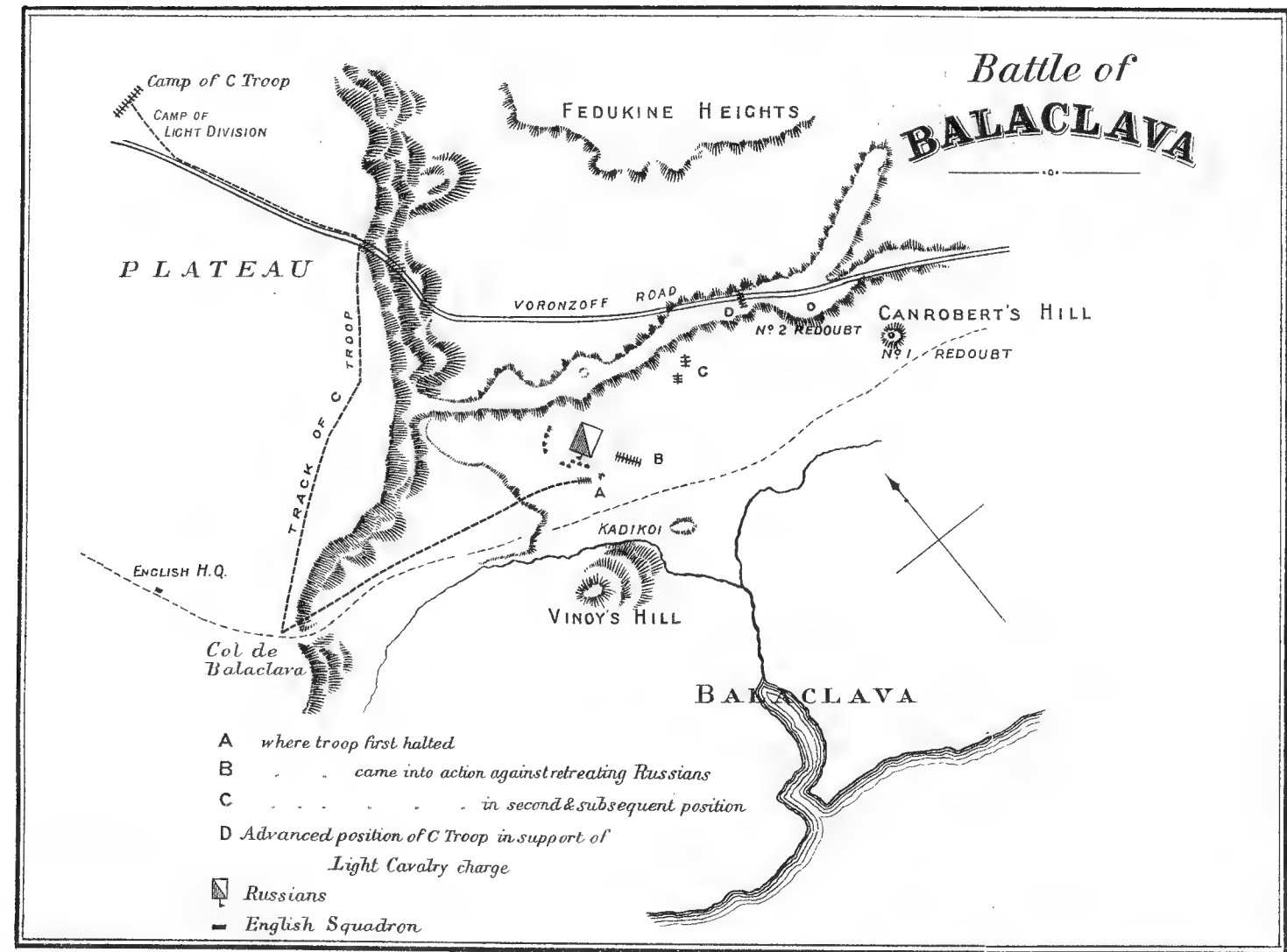
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And what lessons can we draw from this, as far as artillery is concerned, comparatively imperfect action?

We have in the first place an illustration of cavalry acting wisely in not waiting for the guns, for it was Scarlett's bold and prompt conduct in at once facing and charging his huge antagonist, that gave us the victory.

I say we learn next that guns should *always* be quartered or encamped with the brigade or division of cavalry with which they are to act in the field (applause).

We learn that burthens which may not be excessive for horses in peace time, or when the guns are acting with infantry, are too great when the strain of rapid work with cavalry on active service is encountered (applause).

I say too that the guns and cavalry must be within easy reach of one another when the crisis of the fight arrives, and that the artillery leader must have his eye on the combat, and his finger on its pulse, and must act decisively and rapidly *on his own responsibility*, according as circumstances dictate (applause).

And now in conclusion I want to say a word as to the attack of guns by cavalry.

I admit frankly that squadrons can often charge batteries in action successfully. There are plenty of such instances, and plenty too showing a different result for the matter of that. But deliberately to gallop at guns when they see you coming is not the way to set to work. The game is rarely then worth the candle. You will certainly lose heavily, and unless you are supported strongly, even if you get among the guns, you will not be able to do sufficient harm to compensate for the crippled state your squadrons will be in.¹ If in extended order on a

coming fair for his back, but he did not take the slightest notice, and merely remarked afterwards to the N.-C. officer "I believe I had a narrow shave that time."

In October at the Right Attack when great vigilance was necessary, he addressed the men thus: "Oh, good G-d if we are going to let the Russians catch us asleep we had a d—d sight better have remained in England, you know;" and he warned us that, if he caught any night sentry not actively on the alert, he would have him tried by Court-Martial. A night or two afterwards he did confine a sentry for not challenging him though the twilight was barely passed, notwithstanding the man was alert, walking up and down by the horses, and knew the Captain was present, but thought it unnecessarily early to challenge. The man was however tried by Court-Martial and suffered corporal punishment. Brandling, though hard in many respects, never spared himself—with pick and spade and blistered hands he worked well with the men when they tried to hut themselves on the plateau in November, but he had not the sustaining power of Captain Fraser, and he used to say to him "David, I don't know how the Devil you manage to get over the ground." He kept cheery and light-hearted under the most adverse circumstances, and with his merry laugh was often heard from the tent at night chaffing the other officers.

Sir George Brown did not care much for the mounted arms or gay dress, but he began to take a great pride and interest in the Troop, and he seemed to think there was no one like Brandling. A kindly recollection of Captain Brandling as Commanding Officer at a memorable time has prompted these remarks. After the war he changed much in character and became a serious and devout man.

¹ Cavalry even when they get amongst guns are often comparatively helpless. The permanent capture of the 18 guns at Tobitschau remains almost, if not quite, an unique experience. Bredow could carry off or disable none of the French pieces through which he rode at Vionville, neither could our light cavalry at Balaclava. I have seen it stated that in 1849 the drivers of a Prussian battery drove off the Danish Dragoons who had got into the battery with their whips! (Mil: Wochenblatt 61 of 1886).

In an interesting account too of a "Prussian gunner's adventures in 1815" published some four years ago. Lieutenant Von Reuter in describing his grandfather's exploits gives a curious example of how little may disconcert cavalry amongst guns.

At the battle of Ligny the flank of the Prussian battle in question was surprised and taken in rear by fifty French horsemen under a staff officer. "As these rushed upon us the officer shouted to me

very wide front, and all the men in the ranks ride home like heroes, and if there is no escort to the artillery, I dare say some men will always get into the batteries ; but escorts ought always to be with guns at all open to a rush, and I cannot help thinking that men will not keep extended if their flanks are threatened even by comparatively weak bodies. Moreover to turn enough cavalry to do real mischief on to the guns is to commit a tactical error, for it is a first principle in war that you cannot be too strong at the decisive point, and that point in a cavalry combat is where the main bodies meet. If you win there you will have the guns too. If you are beaten there you will have to relinquish the batteries even if you capture them (applause).

But favoured by ground, especially if artillery is made to co-operate with it, cavalry can take artillery or infantry by surprise, and can then accomplish much at but little expense, just as those French regiments did at Albuera, or Von Bredow did at Vionville. Sir Evelyn Wood has told you the latter story in its completeness, and I need only sum it up by saying that on that day with but six squadrons that brilliant cavalry leader succeeded in wrecking six batteries and four battalions, and in the actual attack on them lost comparatively few of his men, for it was after they had passed their immediate objective, and had got out of hand, that they were so cut up. But the aim of the French batteries was disturbed by the German artillery near Vionville, which as Bredow advanced poured a sudden and rapid storm of shell on the guns he was about to charge.

Tobitschau also gives us a valuable example of cavalry attacking artillery, and there too guns co-operated with the squadrons. We find a lesson even in the terse curt phrases of the official account. When that same Bredow, of whom we have just been speaking, stole away suddenly to his left to make a dash at the Austrian batteries, which he had noted were exposed without an escort, the two Horse Artillery batteries with the cavalry division to which he belonged, were turned swiftly on to the hostile guns, and occupied their attention in front while he was making for their flank.

There is a whole lecture, I think, in one little word in the official account, that little word is "guessing." "*Guessing* his motive, General Hartman planted the two Horse Artillery batteries on the bank of the Blatta southward of Klopotowitz from whence they could engage the enemy, draw his attention from the Cuirassiers, and assist their attack."¹

Bredow only lost 10 privates and 6 horses wounded and 12 horses

in German" (says Von Reuter's grandfather), "Surrender, gunners, for you are all prisoners!" with these words he charged down with his men on the flank gun on my left, and dealt a vicious cut at my wheel driver, Borchardt, who dodged it however by flinging himself over on his dead horse. The blow was delivered with such goodwill that the sabre cut deep into the saddle, and stuck there fast. Gunner Sieberg however, availing himself of the chance the momentary delay afforded, snatched up the handspike of one of the 12-prs, and with the words "I'll soon show him how to take prisoners," dealt the officer such a blow on his bearskin that he rolled with a broken skull from the back of his grey charger, which galloped away into the line of skirmishers in our front. The fifty horsemen, unable to control their horses, which bounded after their companion, followed his lead in a moment, rode over the prostrate marksmen, and carried the utmost confusion into the enemy's ranks. I seized the opportunity to limber-up all my guns except the unfortunate one on my left, and to retire on two of our cavalry regiments, etc., etc.

¹ Official account p. 339.

killed in this enterprise, and captured 18 guns, 15 limbers, 7 ammunition wagons, 2 officers and 168 gunners, 230 men of other corps, and 157 horses. Truly, gentlemen, a noble prize for 3 squadrons!¹ and gained, let us remember, by guns being made to co-operate sympathetically with the cavalry (applause).

But that such genial co-operation will be secured by lectures or discussions I do not however believe; I am exceedingly obliged to you, gentlemen, for the patience with which you have listened to me to-day, but I do not for a moment flatter myself that I have by any feeble words of mine advanced the object which I am sure every one in this theatre has at heart. Neither lectures, nor text-books, nor maxims, nor formularies, nor examinations will ever replace *practical work together in the field* (prolonged applause). There is no royal road to efficiency, no way to perfection save one, and that is the more difficult path which is smoothed by hard work, by frequent practice, and by personal experience of one another's needs.

That is what we must strive somehow to arrive at, and there is no use in blinking the fact that to ensure co-operation we must have frequent drill together, and that we can never hope to attain the one if we neglect the other (loud applause).

DISCUSSION.

THE CHAIRMAN—I should like to say that I have had great pleasure in being here and seeing you all to-night, and I may perhaps say now in case I might forget it if I get too deeply interested, that I am very much obliged to you for having elected me an honorary member of this Institution two or three years ago. I assure you that it is a compliment which I appreciate immensely, for a reason which I will tell you presently. I do not want now to speak more than I can help; perhaps you will think it is rather cowardly of me, but one reason for my not being ready to speak is that I feel there are so many officers present who know more about the subject than I do, and at all events I have a good excuse in a bad throat; but I will ask the lecturer presently if he will tell us exactly what his authority was about the artillery not having helped the heavy brigade of English cavalry in attacking that mass at Balaclava; because Hamley says distinctly that the rear of the column was hit by shell before our cavalry got near it, and the rear had begun to waver. Kinglake says that very distinctly too, and I think that Dr. Russell who saw it says the same, but I am not certain about that.

But what will interest gentlemen of the regiment more is this. I was talking on this subject last November to Sir Robert Biddulph and he told me that he was in action firing on the Russian column before our heavies charged. I asked him how many were hit, and he said he certainly saw eleven or twelve shot strike the Russian mass before our cavalry got near them; and he said "I ran to a No. 1 of my sub-division because I saw that he would drop the shot, as I thought, into the right-hand squadron of the Inniskillings." It is not a matter of much importance except to artillerymen, to whom it is always interesting to know these things. There you have an artilleryman who was present, and he says that he was afraid he had an Inniskilling down—but the shot went very close to him, without

¹ Strength about 400 sabres.

hitting him—there was no Inniskilling on the spot afterwards—although he went anxiously to see.

There is a burning point opened by the lecturer, but the Adjutant-General is here, and, if he were not, I hope that we all feel as he does on the subject of orders, and as we have an order now as to the much vexed question of the position of the Officer Commanding Royal Artillery attached to Horse Artillery, I suggest that we do not discuss that; but it may be of interest to you to know that within the last four-and-twenty hours I was speaking to two men upon the subject, if I were to mention their names, which I am not at liberty to do, the cavalryman would certainly be considered here as a representative active man, a man of the nineteenth century, a leading man; and I spoke to a man in the regiment who would equally command your suffrages. I said, "Are you satisfied on that point now?" What was the answer? The artilleryman said "Yes, quite;" and the cavalryman said "I should like to have seen it shoved a little more on to the cavalryman to decide for himself." I say it is an interesting question, but we cannot discuss it, because there is an order at present; but the same time it is interesting to know that the two opposite poles have agreed, I do not say throughout the service, but two men on the opposite sides have agreed, that the thing is what is calculated to bring about the best results for the service, which is what we all want, to whichever arm we belong.

Now as an artilleryman has been talking, and to my great pleasure! we will ask Colonel French first of all whether he will give us the benefit of some observations. I must tell you that I have set three names down here, and after them I will ask Lord Roberts and the Adjutant-General if they will speak; we will ask them last, going on the principle of asking the juniors first, so that we may not be daunted by the opinion of any one senior to ourselves.

COLONEL J. D. P. FRENCH—I cannot help thinking, sir, that as cavalry officers we ought to be very grateful to Major May for the instances which he has given us of the combined action of cavalry and Horse Artillery. I think it must altogether dissipate the idea, if it ever existed, that historical examples of such action do not exist. We see that they do. But whatever lessons such historical examples gleaned from former campaigns may teach, I am quite convinced that we do not yet fully realize the value in modern war under existing conditions of a force of cavalry and Horse Artillery working together when they once thoroughly understand one another and are able to play into one another's hands. I quite agree with the lecturer in what he said. I think the first thing we want is a closer mutual understanding between the two arms. I do not think we understand Horse Artillery perhaps as well as we might, and I do not think they altogether understand us. Up to the present it has been impossible I know to bring us very much together; but it is to be hoped in future we may have more opportunities, and I am sure this will prove of great advantage to both.

The lecturer has touched on one or two points with regard to the combined action of cavalry and Horse Artillery. He talked of the artillery position, and described the details of an action from its commencement, *i.e.*, from the time when the hostile cavalry is first discovered. He talked about the artillery galloping out some distance to the front, or some distance to the flank. I have often heard that question discussed, and I feel sure that officers of far more experience than I have had will give us their opinion presently; but in my humble opinion it is not a question of galloping out to front or flank, but the ground must decide the artillery position and it must be chosen not only because it is good from an artillery point of view but also by reason of the existence of good and extensive cavalry manœuvring ground on one or both flanks, and I also think that you must look at the possible positions which the enemy's artillery can occupy. As Major May says, it all has to be done very rapidly, so that to be efficient leaders we require immense practice;

I even believe that sometimes in the very first phase of the action circumstances may necessitate the cavalry moving rapidly away to a flank rather than the artillery.

Then another point the lecturer touched upon was the time we take to deploy into preparatory formation. I think he cannot quite have meant what he said. He said it took twenty minutes. I do not think he can have meant that, because we take a great deal shorter time to effect this, as every cavalry officer knows. That preparatory formation of course is one which we may use, it is laid down for our use if we like; but it is not in my opinion always necessary, and I think that very often you are better in a more concentrated formation from which you can quite as easily and quickly assume the formation in time for manœuvre and attack.

I do not wish to take up any more of your time when so many better officers than myself are ready to speak.

COLONEL G. H. MARSHALL—I find that Major May in his lecture has said every thing in agreement with my views, therefore I have no questions to ask him. He has told us that the direction of the actual cavalry fight will be short, and that the artillery must get at once to a decisive range. I think that a rapid rate of fire is of the greatest importance, and that we should try by every means to increase our rapidity of fire. It becomes a question of the number of rounds which can be fired into the enemy's cavalry in about a couple of minutes. It may interest you if I give you some recent figures of rates of fire against cavalry targets.

In 1892 at Okehampton the *average* time for 18 rounds of shrapnel was two minutes: the *best* record was 18 shrapnel and two case in one minute fifty seconds.

In 1893 at Okehampton, a battery on the march attacked by a surprise target fired 25 case in two minutes three seconds. A battery fired 46 shrapnel and two case during two cavalry attacks at the average rate of $13\frac{1}{2}$ rounds a minute.

The figures taken from some of the practice in India last year are also very interesting.

Horse Artillery Camp, Gurgaon: average of six series: ranges from 1300 to 1700 yards: time $3\frac{1}{2}$ minutes: 18 shrapnel fired: hits 10 per shell (one battery made over 500 hits). Targets—screens representing four squadrons.

Average time for 12 case, 45 seconds—average hits on screens at 250 yards, 400.

I mention the above details to show how much importance we attach to rapidity of fire and how anxious we are to increase it.

MAJOR-GENERAL BOYCE COMBE, C.B.—I should naturally hesitate when called upon in the presence of so many war-worn veterans, but as General Officer Commanding the Cavalry Brigade at Aldershot, it is supposed that I have or ought to have some ideas on the subject, and anyhow having been called upon by the chairman, I feel bound to say something.

I am sorry to begin by differing essentially from Major May in his concluding remarks, to the effect that he had no hope that anything which he said here this evening could possibly lead to any amelioration or improvement. On the contrary, I think that he ought to feel very much flattered by the audience that he has had, and the great attention which has been paid to his interesting lecture; and I, for one, sincerely hope that the remarks which he has made will lead officers to study past history, which is really all that we have to trust to for guidance as to our action in the future.

I know that there have been a great many attacks made on the cavalry lately by more or less friendly critics, and I always feel strongly that we have not a fair chance. At field manœuvres, I have heard it said over and over again, and it is quite true, that nothing is so unlike real war as sham war; and this I think applies more particularly to cavalry than to any other branch of the service, as for instance on

the field of battle when the cavalry and Horse Artillery are performing what Major May spoke of as the corps duties, there, our opportunities, as you all know, lie almost entirely in fleeting moments when the enemy's infantry, or whatever it is, is more or less disorganized, half beaten and demoralized, or flushed with success and pressing boldly on. Then comes or would come our opportunity in real war.

But when do we ever get those opportunities at manœuvres? We simply cannot get them, or cannot take advantage of them. We often have a rainy day and we often flatter ourselves that we have a dull man in front, but we cannot always get the umpires to admit that much even, and in deprecation of the severe remarks which have been made I must repeat that the cavalry do not have a fair chance at sham-fights, and that they certainly do not have the opportunities that they would have on the actual field of battle, of which I hope we should be found prepared, as we have ever been before, to take advantage.

There are one or two minor points upon which I differ from Major May. One is about escorts for the Horse Artillery. He seemed to attach importance to Horse Artillery having a more prominent escort.

MAJOR E. S. MAY—Not a strong one.

MAJOR-GENERAL COMBE—They hardly want any at all; they practically want a very small escort just to furnish scouts and to prevent their being taken by surprise, because the duty of the nearest body of cavalry is to support them, and to turn to the protection of their artillery; and they must trust to that. Then again, in the action, when once the attacking force, the two lines, are in the van of operations, the artillery must cease fire; and then I think they ought to limber-up and move up to the front as fast as they can; it is no good thinking of retreat; their whole fate depends upon the cavalry. If the cavalry is beaten the artillery is lost; it is no question then of limbering-up and getting away—the guns are gone.

LIEUT.-GENERAL SIR WILLIAM STIRLING, K.C.B.—Sir Evelyn Wood, and gentlemen. It seems to me that in order to have effective co-operation between guns and cavalry we must come to some more definite understanding than we have yet arrived at as to the weight behind the team. It is a curious thing that we should have got nearly to the end of the 19th century and that there should still be uncertainty upon this point. This evening reference has been made to a 6-pr. troop and a 9-pr. troop working with cavalry. I do not know whether any gentleman here holds that guns can co-operate with cavalry with a weight behind the team of 40 cwt. I maintain that they cannot (applause). Guns have altered in the last fifty years, but horses have not, and I do not think that we can get more out of our teams now than we did in the Peninsula; and if so we are surely not justified in setting aside the experience then gained, and in overweighting our teams as the tendency is in the present day.

The wonderful things that were done in the Peninsula by Horse Artillery co-operating with cavalry, and the wonderful things that were done in India by Horse Artillery co-operating with cavalry were I believe in every case with a weight behind the team of under 30 cwt. It is true that before Waterloo certain Horse Artillery batteries took over 9-pr. equipments, and the results showed that this was a very wise arrangement; but there is nothing in that campaign, as it seems to me, to warrant the conclusion that because those Horse Artillery batteries had 9-prs. in this memorable action and did good service with them that therefore it was possible for a gun of this weight to co-operate effectively with cavalry. And I think that that must also have been the opinion of those in authority; for when the expedition was fitted out for the Crimea the battery which was told off to co-operate with the cavalry was "I" Troop, R.H.A., with a 6-pr. equipment. "C" Troop R.H.A., was sent out at the same time, with a 9-pr.

equipment, but it was not attached to the cavalry but to the infantry. Each infantry division had two batteries, and those two batteries of the light division were made up of "C" Troop, R.H.A., and a field battery. Up to the 25th of October, 1854, "C" Troop remained with the light division up in the front, as the lecturer has pointed out. On that morning when Balaclava was threatened an order came for the artillery of the light division—the 4th division and I think the 3rd division—to move down to Balaclava. The distance from the light division to the heavy cavalry camp in the plain before Balaclava was five miles and "C" Troop covered this distance much quicker than the field batteries and arrived in time to take part in the heavy cavalry action as already described.

After the 25th of October, 1854, "C" Troop never returned to its old camp with the light division; but remained with the cavalry, and was with the cavalry on the heights on the 5th November covering Inkerman.

Again at the Tchernaya on the 16th of August, 1855, "C" Troop was with the British cavalry and Horse Artillery in reserve. After the fall of Sebastopol on the 8th September, 1855, a cavalry division of 40 squadrons was formed at Eupatoria to the north of Sebastopol to threaten the Russian communication to which three Horse Artillery batteries were attached. There was a Turkish Horse Artillery battery with comparatively light pieces and only four horses in the team I think; there was a French Horse Artillery battery with six horses in the team, armed with the piece that had been an 8-pr. and was now bored up to throw a 12-pr. projectile, and considered to be good up to a mile; and then there was "C" Troop, R.H.A., with its 9-prs. of 39 and 40 cwt., with 8 horses in the team and 10 mounted men in the detachments.

During the five weeks in October and November, 1855, that this force remained at Eupatoria there were three reconnaissances in which the whole cavalry took part supported by a strong Franco-Turkish infantry division. There were also several smaller reconnaissances made by portions of the forces. The country was quite perfect for cavalry and Horse Artillery to work over, an undulating grassy steppe, but water was scarce and very bad and the force could not on this account remain out beyond the third day on either occasion.

The experience gained by "C" Troop even working over this very favourable ground and with excellent horses in good condition was that the weight behind the teams was quite excessive and that both the extra pair of horses in the team and the great weight of the equipment would effectually bar co-operation with cavalry under normal circumstances.

Gentlemen, we do not want guns that can just be rolled up into position and there stand and blaze away at long ranges; we want to come to short ranges and to be able to keep up with the cavalry; and I think, sir, that the whole question of the co-operation of guns with cavalry turns upon the weight that we put behind the teams (loud applause).

LIEUT.-GENERAL KEITH FRASER, C.M.G.—Sir Evelyn Wood, and gentlemen. I must first say a few words of thanks to the lecturer for the kind way in which he spoke about myself and the interest that I have taken in Horse Artillery acting with cavalry; for I have always been led to look upon Horse Artillery as the right-arm of the cavalry. Major May has spoken of my father's services at Waterloo. I have always been told that my father's greatest friend was Sir Augustus Frazer, who was no relation but whose name is I think pretty well-known here as having commanded the Horse Artillery in that battle (applause). My father named a son after him.

Gentlemen, I must say that nothing can be a greater satisfaction to a cavalry soldier than to see such an audience as there is here to-day assembled to listen to such a lecture as we have had. I look upon the last three or four years as a time of revival of the association between Horse Artillery and cavalry.

To the lecturer I think much is due. I have heard him lecture before admirably in London on this subject. Other lectures have taken place; and much greater attention has been paid to the subject of late than was formerly the case.

It is I believe true—perhaps it may be partly the fault of some among ourselves—the cavalry—that we have not taken advantage of the opportunities that we have had of working with the Horse Artillery as much as we might. Although in England we have few grounds large enough for tactics of cavalry and Horse Artillery, and we know on the highest authority that the best tactician if he had to manœuvre cavalry with Horse Artillery on ground only a mile and three-quarters square would be at his wits end; still I think we have certain places where we might do more than we have done. Look at the Curragh where I have held command myself and at Aldershot. There are opportunities of teaching at both those stations, the “principles” upon which cavalry can work with Horse Artillery, and we might teach the “principles” of it though there is not much space for its “practice.” I hope that in future more advantage will be taken of those grounds and that cavalry and Horse Artillery will be stationed together and work together as much as possible. I wish that in England there were more places where it could be done; but we know what the difficulties are that stand in the way. Of course in India they have grand opportunities, which I feel sure are taken advantage of, and certainly our cavalry leaders, when they come home ought to be well able to command both arms. That such practice is wanted we cavalrymen and Horse Artillerymen all know. I have personally had the great advantage of having had for some years even as long ago as 1877, the command of a brigade of cavalry on many occasions and my batteries were officered by men of whom I have the very highest opinion (if I told you their names you would agree with me). Both they and I saw at once, I think, when we began to work together, that we had a great deal to learn. I must say that I have always felt most grateful to them for the way that they tried to meet my views and to help me on every occasion.

I have had a good deal of opportunity of seeing and hearing abroad the opinions of great authorities on this subject. One of the most brilliant artillery officers, the Archduke William of Austria (the son of the great Archduke Charles), who met his death by a sad accident last year, the man who commanded the artillery at Sadowa and covered that retreat with his 160 guns which, with the 1st and 3rd divisions of cavalry saved the Austrian army from entire destruction, spoke to me a good deal about Horse Artillery. He said that he had always had a great prejudice against it, partly because of the great mass which it shows as a mark for the fire of the enemy, and partly because of its great expense; but he said that he had come to the conclusion that it was well worth the expense and the risk due to the great mark that it shows to the enemy. “I have entirely changed my views,” he said, “and I would have as much Horse Artillery as I could possibly get.” The Emperor of Austria himself told me at the time “It is merely a question of money with us; we should have much more if we could afford it.”

The lecturer has exceedingly well described that battle of Albuera in which the Horse Artillery and the cavalry did so well. One thing that I was thinking all the time was, what a pity it was that we had there as usual so few cavalry. It has always been the same with us. We had half the strength of the French at best—had we had more we might have saved many of the gallant men’s lives who fell on that day. The French with their masses of cavalry overpowered us.

There were some remarks which the lecturer made with regard to tactics, which I hardly like to touch upon. The drill-book is a book to be obeyed, and I would not say a word against it. I have no doubt that everything has been well considered and carefully laid down in that book, and, at all events, it is not for me to discuss it. But one thing that he said was what Colonel French has already mentioned, and that is, as to the time that it takes for a division of cavalry to get

into the normal preparatory formation. Well, a normal formation, to begin with, is only given as a sort of guide. There is no time for asking for instructions in the cavalry and a normal formation is of great use to a commander of a line who has received no instruction as may be the case; at the same time preparatory and fighting formations admit of many variations. But as to the time that it takes; why, to deploy with attack formation takes no time at all, it is done during the advance. I am afraid there is no twenty minutes to spare. If we could have a nice twenty minutes for our artillery to fire I should be very glad, but I think if you have five minutes you would be extraordinarily lucky.

With regard to the fire of Horse Artillery being entirely against the enemy's cavalry, I do not know that the Regulations lay that down so clearly. It says that it is to be against the cavalry because the cavalry is a dangerous arm at that time; but I do not think it forbids what the highest authorities on the Continent insist upon, namely, that the enemy's artillery should first, if possible, be crushed. And from what Colonel Marshall tells us it seems that you have only got to fire one or two shrapnel at an enemy's battery and you have done with it—your cavalry will be perfectly free, because it will have no enemy's guns to fear—with such power of destruction as Colonel Marshall has described you will have destroyed everything for a space of 200 yards at least round the battery.

With regard to Horse Artillery going straight to the front or to the flank, I agree with Colonel French that there is probably only one position for the artillery and which that is the Cavalry Commander taking counsel with the Horse Artillery Commander will have to decide. It is all the better if that position lies to the front, and if he can manœuvre round the enemy's flank so much the better; but that flank movement of the cavalry takes up time it must be remembered, and will the enemy give you time? I think it must depend upon circumstances whether you go to the front or to the flank; it must depend upon the best position for the guns and upon the nature of the country; and on the principal factor, the enemy.

With regard to an escort some seem to think that a cavalry escort is necessary for guns. I must say that I do not agree with that. If the enemy sends out a regiment and you have a squadron as escort the latter will be of no good as protection.¹

A sufficient number of scouts well out to the front and flanks watching carefully against surprise should be sufficient for them.

With regard to the opinion expressed that an attack on artillery is useless. I think that if the artillery is firing heavily on you it is a good thing to make a feint or even an attack with a squadron or two, or even more, to draw the fire away from the cavalry, for the moment any portion of the enemy's cavalry threatens a battery you may be sure the fire will be turned on the former, which, if in extended order will suffer little. I have seen in Germany a large force of cavalry attack a line of guns. It is a thing that is constantly practised—a whole brigade or division will be taken to do it. Captain Grierson well describes how it is done, in the accounts of last year's manœuvres in Germany. The first lines are being widely extended, the second lines less widely, and then some *échelons* on the flank, and then reserves, riding right up to, round and *through* the guns and going on beyond, attacking any troops that may be behind the guns. I am afraid I have kept you a long time. I can only say further in the words of one of our greatest artillerymen, the loss of whom we all regret—a great authority indeed—General Hamley, "let it be granted that cavalry properly trained and led, may play as great a part as ever on the stage of war; combined with new and larger proportion of artillery its action may be decisive to the fate of battles, and launched in pursuit of a broken

¹Prince Frederick Charles, Prince Kraft zu Hohenlohe and all modern authorities deprecate detaching squadrons as escort to Horse Artillery. Home's "Précis of Modern Tactics" gives reasons clearly for this.

foe, it may finish a campaign which would else wade through carnage to its woeful end" (applause).

GENERAL LORD ROBERTS, V.C., &c., &c.—Gentlemen, I had no idea of speaking when I came into this room this evening, but as Sir Evelyn Wood has expressed a wish that I should say a few words I will tell you what has struck me with regard to the lecture.

In the first place I would express the pleasure it has afforded me to hear Major May's lecture and the interesting accounts that he has given of instances where cavalry and Horse Artillery have worked together. Some of them I had never heard before. I have always had the strongest opinion of the advantage of cavalry and Horse Artillery working together, for although my opportunities on service have not been many, I have seen how much they assist each other; and I have been with cavalry in positions where it would have been at a great loss without Horse Artillery.

The value of a lecture of this sort to my mind is that it not only gives instances but brings to our recollection events which we may have forgotten in past history. Moreover, it removes that feeling of disappointment which I have often myself felt, and which I should think probably other officers may have felt, at peace manœuvres, when we find how difficult it is to judge how cavalry and Horse Artillery can assist each other; because, as General Combe said just now, in a sham-fight the reality of battle is wanting, and without that reality you cannot tell the time, the instant, when Horse Artillery and cavalry can each do so much for each other.

As regards the first preliminary movement I have often been puzzled when thinking how artillery could most advantageously take up its position for attack, so as to bring an effective fire upon the enemy without interfering with the cavalry; but on one point I have no doubt, and that is as to the necessity for Horse Artillery being mobile. My friend Sir William Stirling has already touched upon this. I consider it most essential and nobody has striven more than I have for years past to have the weight behind the Horse Artillery team reduced as much as is possible consistent with efficiency. I think that 30 cwt. is about the right thing, and I am very pleased indeed to hear that this new gun, which I believe is now in use at Aldershot, has been reduced to that weight; I have been told by the officer commanding the battery that the gun shoots well and is in all respects satisfactory.

Another most desirable point is one that was mentioned just now by Colonel Marshall, namely, rapidity of firing, which to my mind is as important as mobility. If the fire cannot be rapid there is but little use for Horse Artillery when acting with cavalry, because in an attack its opportunity is too fleeting to admit of delay. With all due deference to Sir William Stirling, I think that the cavalry is what the artillery should aim at in the first instance; the cavalry is the enemy with which you are chiefly dealing, and it is the business of the Horse Artillery to do them all the damage it can before the collision of the two cavalry forces takes place. The Battery Commander should select a position where he is able to see the enemy's cavalry and give them as many rounds as is possible in the very short time he may be able to direct his fire upon them. With mobility and rapidity and accuracy of fire Horse Artillery can do wonders, and my hope and belief are that in future wars our cavalry and our Horse Artillery will do as much, if not more for each other than they have ever done in the past.

I am delighted to have come here this evening, it has been a very great pleasure to me, and I hope that the Adjutant-General will now say a few words.

GENERAL SIR REDVERS BULLER, V.C., G.C.B.—Sir Evelyn Wood and gentlemen, I came here to-day to learn, and not with the least intention of speaking; but as I am told that I am to say something I will try to do so.

One thing especially impressed me in the lecture (General Boyce Combe mentioned it) and that is that the lecturer was under a great mistake in thinking that a lecture of this sort does not do good. I am satisfied that nothing can do more good than this sort of discussion. An able man looks out facts from ancient history and puts them before us; many of them we have not heard before; and we apply our own ideas and practice to them and we are at once impelled to think, and out of that thinking good must come.

And I should think that there is nothing that requires more thought than this very question of the co-operation of cavalry and Horse Artillery. For as I was listening to the lecturer it seemed to me that, dealing with the question merely as a question of combined action of cavalry and Horse Artillery, the one important factor is that of "time"—you must arrange to save time. When an operation is about to occur and the hostile forces are in sight of one another, they both move so fast that there can be very little time indeed for manœuvres or for a decision to be taken as to the nature of the attack that is going to be made. That being so it seems to me that it is eminently necessary to settle definitely beforehand who is then to decide upon the policy to be taken up. It was rather suggested by Colonel French, I thought, that the artillery were to set the policy of the attack; with that I cannot agree. It seems to me that the enemy's cavalry are really the objective; that is what you have to destroy and it is by your cavalry that you have to destroy it; therefore it must be the cavalry leader who is to decide what is the best way for his arm to attack the enemy's cavalry. That being so the first action of the artillery, it seems to me, must be subsidiary to that of the cavalry leader. I agree that whether it goes right, left, flank or front is immaterial, but the one thing that seems to me absolutely essential is that the artillery must be guided everywhere by the cavalry—it must not hamper the cavalry—(applause). It is necessary, therefore, I think that the artillery leader should be thoroughly in touch with the cavalry leader and should not only know what he is going to do but should know him well enough to be able to thoroughly appreciate his intentions; not only know what he is going to do but should know it in such a way as to be able to realize how he is going to do it. If the artillery look to that I believe you will see what you so seldom see in history so far as we have any account of it, the artillery and cavalry acting well together.

For that reason I must say that I personally most cordially endorse the necessity for, and would in every way that I could encourage, all possible practice together for cavalry and Horse Artillery; they are the two most expensive arms that we have; they are the arms which require the longest training and they are the arms certainly which require the greatest practice in working together—and therefore they ought to have it.

I should not really be justified, from lack of experience, in remarking upon any other matter, but two points have been raised which I may perhaps touch upon. General Stirling and the lecturer both raised the question of mobility; but with the Horse Artillery the question of mobility in our service has always largely hung upon that other fact which has not been mentioned to-day, namely, the question of fire effect. No doubt rapidity of fire is an element of fire effect, but the weight and velocity of the projectile is also important and the question of the weight of the projectile has had a great deal to do with the weight of the gun. In the new gun there has been a certain amount of the power of the gun given up, and the Horse Artillery have now a gun of 30 cwt. behind the team; I believe it has given satisfaction, and I hope it will meet their wishes. But of course it is not as powerful a gun as was originally asked for. I am told by the manufacturers that hitherto mobility has always been asked for, but at the same time a fire effect has been asked for which it was impossible to give with the desired mobility. I am glad to say that this year although the Army Estimates show but one more of

these new batteries, I believe we are going to have three, and they will also show I believe an increase of seven batteries to the Field Artillery (applause).

The only other point to which I would allude is the question of escort. Personally I must say that I attach great importance to the advantage of an escort. I cannot believe myself that an officer in the position of Commander of Horse Artillery in action ought to be expected to have the least regard to his own safety. He has to watch the course of the fight, and we have just been shown by examples from history how important it is for him to do that. He has to consider the range and effect of his fire and all that sort of thing, and it is impossible for him to do that properly if at the same time he is looking after the safety of his battery. Anybody who has ever seen a cavalry engagement at manœuvres—the dust, the general confusion, and the speed at which the horses go—will I think agree with me that if the battery is left to the chance of the nearest cavalry officer protecting it its protection will be a very bad one. For that reason I certainly advocate an escort, though a small one. In conclusion I have to thank the lecturer for his most interesting and most instructive lecture.

THE CHAIRMAN.—The Adjutant-General touched just now on a point which is of very great interest to me, about the greater training that is required. I do not know that we shall ever get the best results until all three branches of the service go back to something which in this regiment you used to do; I am afraid it is now only done in certain batteries. You used to give a subaltern a very thorough instruction in what every driver and every gunner has to do. I will not say what I think of you now, because you all know that I think very highly of you; but 30 years ago I thought a great deal of your superiority over the two other branches, which arose from the same system. It was a great point too in the navy, *i.e.*, that every subaltern had to do everything that has to be done by a second class boy, a first class boy, an ordinary seaman and an able seaman; and I should like to see you go back (and I am going to say the same about the infantry and the cavalry) to what you did when probably General Stirling joined—that every subaltern before dismissal from drill should ride in the lead, in the centre, in the wheel, and go downhill, he will then appreciate exactly what 39 cwt. is behind him, and especially on a straight-shouldered horse! In the same way I should like to see every cavalry officer ride in the rear-rank, and in the dustiest part of the Long Valley, and then he will appreciate really what a trial a rear-rank man undergoes. In the time I have been at Aldershot I have seen a most enthusiastic subaltern in the infantry drive a man into insubordination, and we should have had a very bad case but that a sergeant stepped up and put his hand on the man's mouth, because the boy was trying to insist on this man doubling in marching-order, on a very hot day.

Of course the Adjutant-General was speaking in a higher sense just now of trying to get a more thorough training and a more thorough appreciation on the part of the cavalry of what artillery can and ought to do, and a more thorough appreciation on the part of gunners than they really have, not so much of the cavalry but of the object in view, that they are not there to fire off their own guns at all, unless those guns are going really to help the cavalry to gain the victory.

Unfortunately for myself I look back a good many years, but it is a very great pleasure to me when I think what the feeling is amongst you all here to-night. I have fortunately had the happiness of knowing a great many of you from my having been at Aldershot. When I look back to the time when I began my service, the only book that existed for a boy who wanted to know anything about his work was a morocco-covered brown-backed book, which no doubt you know—“Lefroy's Handbook for Field Service.” I remember having to do a report on the enemy's position; I did not know at all how to do it, and I turned to the book in my first trouble to try and gain, on service, what I ought to have learnt, of

course, at home. But that is not the only point, and that is not the most valuable point, perhaps, of the change that we have seen. It is only 15 or 20 years ago that I asked an artillery officer, "What do you think of So-and-So?" "Oh," he said, "he is the sort of fellow that you do not see at Woolwich; he goes to India and the Colonies, and that sort of thing!" Gentlemen, there has been a vast change in this regiment since then! You realize now that Woolwich is not the only place (applause), and in realizing that, it is an advantage not only to the regiment but to the whole Service. You have learnt to appreciate the other branches and now I am glad to say the other branches are learning to appreciate you. Yours is not a sealed book at all! It would be absurd for us of course outside the regiment to try and learn all the small details of guns, especially as they are now so complicated; but we can learn to catch the broad principles, especially where your work runs into that of the other two branches.

I have been talking in rather a high strain so now I will tell you a story which may interest you, which occurred to me after having seen the synopsis of the lecture as regards Albuera. Napier tells the story, and tells it very well—that Colonel Hardinge sent back those troops which had retired from *there, i.e., the bridge (pointing to the map)* and ordered up the Fusilier brigade. I asked Arthur Hardinge (I was there in 1888, going thence straight to Gibraltar) "is that true?" "Oh no," he said "not a bit of it, my father often talked to me about it. But he was trying to persuade Beresford to hold on." Beresford was a very brave man, and I should not tell you the story except that it is very well known; but he had been greatly "hustled;" a Polish lancer had got behind him and he very nearly got his spear into the general who caught the lance and turned it away. There were three or four others trying to kill him at the moment, and Beresford, seeing so many men down, had his head inclined backwards, when Hardinge rode up to him and said "I think, sir, I ought to tell you that you have a peerage in one hand and a court-martial in the other." Beresford waited a moment or two and then turned round and said "I will go for the peerage." That is really what occurred.

And I am tempted to tell you one more thing, that I came upon only a day or two ago. This is only a small point—the lecturer brought into my head in talking of Waterloo—but it gives a great example which brings home to us the great qualities of some of those gunners who have gone before us. Coming away from Genappes it rained very heavily. (I am alluding to the 17th of June, 1815.) The rear battery were being pressed. It had no cavalry behind it, but the ground was so heavy that the enemy could not move off the road. A wheel-horse cast a shoe, and the officer in command of the battery stopped there and then, sent some gun detachments back to keep back the French, who were skirmishing, stopped till he got his shoe tacked on, and then trotted on again. I have always thought that that must have been a very good man indeed.

Just now I was speaking of the change of tone in the service, but if I may say so as an outsider, I am very anxious to see something more. I have put you gentlemen out of my mind for the moment, do not think that I am alluding to the lecturer only, but I am anxious to see a greater joining together of artillery officers, and not only artillery officers but of the army officer who writes, and the army officer who only rides to hounds, is a very fine fellow and plays polo—because until we get that we shall not get the best results. When I went to Aldershot that system was never acted upon, in other words the mingling of theory and practice. I am not speaking of course of any particular person. We happened to have a General there who is a great friend of mine, General Williams; and I have to read you a letter from him saying that he regrets he is not able to come here; and he urges what Lord Roberts and Sir Redvers Buller and all of us agree with, a greater intimacy between cavalry and Horse Artillery. He urges their living

together and being quartered together ; but he says something more which I think you would care to hear, as it is interesting : "drill and manœuvres of Horse Artillery and cavalry together is made much more difficult by exaggerating the cavalry's first line. If officers learn to drill and manœuvre cavalry and Horse Artillery as one command, they will not be inclined to come into action with their guns at other than short ranges. In most cases of finding, I maintain that nobody should begin at long ranges." There are not many of us here probably who would accept everything that our friend General Williams says ; but he has got the great true cardinal principle that artillery live, or are paid not to live but to kill people. If consistently with killing people they can live that is all very well ; but he was never tired of dinning into my head the drill-book which (whether he gave it the impress or not I do not care) as it stands, bears that great truth on it, that it is a good thing to save your skin if you can, but that artillery are not to regard any loss of themselves of any nature, whether it is of *personnel* or the guns themselves, but that they should go into action regardless of all that in order to win the action. Well, General Williams often says, what perhaps sometimes we cannot all agree with, but everyone who thinks about it will realise, that that is doing the work for which we are paid, and doing it in reality as we should all like to do it.

There is one point upon which someone, Sir William Stirling I think, rather startled me, in saying that he did not want an escort for guns. Well, if we were all as good cavalry soldiers or gunners as a great many of you people here are, I should not mind so much ; but if I were an opponent I should very much like to see you do without an escort. For if something occurs, some one charges you and you then withdraw very suddenly, then will arise an opportunity for cavalry. Perhaps I have this a little on the brain, because I have been studying cavalry achievements, and I have read of 21 guns taken with not one man wounded, and that was because the artillery had no escort ; they thought they were quite safe ; they were going along a safe route. A very bold man saw that they had no escort, and got them ! And that may be our fate if we have no escort I am afraid. I once said to the major of a battery who had just got a brigade-division—"Are you happy?" he said "No I am not happy ;" I asked, why "I have been hating my Colonel now" he said "for five years and now that I am going to be 'one I shall have three fellows hating me." You suffer from that no doubt ; but you scarcely suffer so much as the cavalry did 80 years ago. One of the most remarkable things at Waterloo, and to a certain extent in the Crimea, was that no cavalry General would ever allow his colonel to do anything ; there were four cavalry brigades actively employed at Waterloo, but no colonel ever got a chance with his own regiment. General Vandeleur led one regiment and Lord Uxbridge led a squadron ; but General Vivian, who is my climax, had three regiments in action. He halted two ; he led one and told it to rally, and then he came back and took up the next one, and it was only night-fall which prevented his charging with the third regiment.

I have kept you twice the time that I meant to do.

Have you anything to say, Major May ? I think we have agreed with you altogether.

MAJOR E. S. MAY—Gentlemen, I really think that I was very bold to give a lecture on this subject now that I see all these distinguished cavalry officers present, and indeed I feared when I looked at them that I might possibly be devoured. I am very relieved that you have let me down so gently, and am much obliged for your moderation. I don't want to detain you longer, and I think there is only one thing that I seem to have made a mistake about—when I said that the cavalry would take 20 minutes to get into a preparatory formation. I want to tell you why I said that. You will remember in the first place that I said that I spoke

with great diffidence before so many cavalry officers, and I confess I have had no close personal experience on that point ; but I was looking up this subject for my lecture, and I found in a certain text-book that it was laid down that they might take—I think it said from a quarter of an hour to half an hour¹—at any rate some enormous time. It struck me at the time as exceptionally long, and I therefore steered a middle course. I suppose the time taken depends largely on the march formation and the nature of the country, but all I meant to dwell upon was that, if the cavalry were delayed while getting into the preparatory formation, and the enemy's artillery opened upon them, when the squadrons were stationary, our guns, in spite of what I said as to decisive ranges, must unlimber and engage the hostile artillery—I wanted to lay stress upon that point too, because I had said just before that they were only to fire as much as possible at the enemy's cavalry. I am very glad to hear that I am wrong about the time, and that our cavalry will be so much quicker than I gave them credit for.

With reference to what Sir Evelyn said as to artillery having fired on the Russian cavalry I must admit I was under the impression that the victory was entirely due to the good swords of our dragoons, and I was prepared to give them all the credit.

As regards an escort I am afraid I am still strongly of opinion that we ought to have an escort ; because, if you do not, I think that the officer commanding the artillery will hardly act with the same vigour and decision that he would show if he had one. If he is continually thinking about his flanks and so on he will not have his mind free to attend to his proper business. I want to say this, however, that if you keep cavalry and Horse Artillery close together, as they were at Balaclava, you could get on, perhaps, without one, though I would rather have one even then ; but from what I have seen at manœuvres, the Horse Artillery are often perhaps nearly a mile away, or occasionally even more, from the cavalry ; and on such occasions it has struck me, that when without an escort a clever cavalry leader might with a small force paralyze their action. In fact I have seen the very thing happen. I saw one day a squadron detached from the main combat and go for the hostile battery at extended files, and it was a great question whether it would have got in or not ; I think myself, and I was an umpire, that it would. Supposing it had. It might not, certainly I think would not, have captured the guns, but it might have killed a good many horses and some men and it would certainly have disorganized the battery and neutralized it for a time. And it seems to me that it might pay to thus detach a squadron, if guns were left isolated in the way I have in mind. I think myself that sometimes our artillery perhaps forget and don't follow the cavalry, or that the cavalry perhaps forget the artillery, and so it happens that the guns are exposed. I say that the strongest example that you can have of the need for an escort was at the fight I have quoted of Tobitschau where you had those 20 Austrian guns charged by only three squadrons, and the three squadrons did not lose a single man killed, yet captured all but the whole of the guns, *because the guns had not an escort*. If they had had an escort that would have prevented Von Bredow from making that successful charge.

I am very much obliged to you, gentlemen, for your kind reception of my lecture, and I thank you.

¹ “ $\frac{1}{4}$ to $\frac{1}{2}$ an hour” are the words.

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DIARY
OF
LIEUTENANT W. SWABEY, R.H.A., IN THE
PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 199, No. 4, Vol. XXII.).

PART II.

THE CAMPAIGN FROM APRIL TO NOVEMBER 1812.

Summary of the Peninsular Campaign from April to November 1812.

The capture of the important fortresses of Ciudad Rodrigo and Badajos was a great gain to the allies, and a severe blow to the French hopes of being able to force the English to evacuate the Peninsula, as recorded in Part I. of the diary. Lord Wellington was now no longer bound to Lisbon, but had acquired new bases of operations on the Guadiana, the Aqueda, and the Douro, and he could choose his own field of battle in Spain. Nevertheless the strength of the French armies in May 1812, was very formidable, amounting to 170,000 men distributed in Andalusia, in Leon, in Old Castile, in Aragon and the eastern provinces, whilst Madrid was held by a force under King Joseph and Marshal Jourdan.

The allied British and Portuguese army though much inferior in numbers had attained great efficiency; Lord Wellington, therefore unwilling to allow the Spaniards to sink into apathy, decided to continue the offensive, and by operating in the north of Spain to liberate if possible the southern provinces where the best spirit prevailed, and which offered a suitable field for the Spaniards to renew their exertions.

In accordance with this plan the force under Sir Rowland Hill which covered Badajos and held Soult in check at Seville, sent in May a detachment which seized and destroyed on the 19th the bridge of

boats at Almaraz, the best and shortest line of communication between the French armies north and south of the Tagus. This important design accomplished, Lord Wellington on June 17th, crossed the Tormes near Salamanca, and by July 2nd, succeeded in driving Marmont from that neighbourhood towards the Douro; a series of manœuvres ensued between that date and July 22nd, upon which day the French were defeated at the battle of Salamanca, and then pursued to Valladolid, and as they still continued to retire northward, Wellington re-crossed the Douro, marched on Madrid, drove the King with his troops from the place, and entered it on August 12th.

The allies had thus defeated a powerful army and driven King Joseph from the capital, but as Soult still remained in Andalusia, the main object of the campaign—to draw the French armies from the southern provinces, so far had not been attained.

On that account, Lord Wellington directed the troops at Cadiz to manœuvre against Soult's force, while Sir Rowland Hill, who during the period between May and September had been constantly skirmishing and manœuvring against a portion of the same army under Count D'Erlon, took post on the Tagus and marched towards Aranjuez and Madrid. At the same time (September 1st) leaving a small garrison in the latter place, himself marched northward against the army of Portugal now commanded by Clausel. The French fell slowly back on Burgos, the siege of which was begun by the allies on the 17th.

Soult meanwhile finding the war steadily progressing in the north, on August 25th, raised the siege of Cadiz and concentrated at Granada, where hearing of the movement on Burgos, he marched northward and on September 29th, at Albacete, united with the King's army.

The approach of these combined armies on Madrid, and the failure to carry by storm the castle of Burgos, compelled Wellington on October 21st to raise the siege, and in conjunction with Sir Rowland Hill's force to retire on Salamanca, in front of which place they took up a position. On November 10th, the French concentrated on the right bank of the Tormes, a force nearly double that of the allies; but as the latter were much worn and exhausted by incessant marching and constant exposure, Wellington preferred retiring into Portugal to the risk of fighting a general action.

On November 15th, the army therefore broke up from Salamanca, and during the three following days owing to inclement weather, bad roads, and irregular supply of food, the distress of the army was extreme. The French light troops pursued them closely for two days causing much inconvenience and loss. On November 18th, head-quarters entered Ciudad Rodrigo, and when it was ascertained that the French had retired from the Tormes, the army was put into winter cantonments.

In reading the foregoing summary it should be borne in mind that "E" troop was with the army under Lord Wellington, while "D" troop, to which Lieutenant Swabey was attached, was with that under the command of Sir Rowland Hill.

DIARY.

CHAPTER I.

Lieutenant Swabey is attached to, and joins "D" Troop. Skirmishes. Defeat of General Slade's Brigade. Flag of Truce. Gallant affair of Lieut. Strenowitz.

22nd April.—This morning in consequence of an order received last night, I set off alone to retrace my steps to Spanish Estremadura, to do duty with Captain Lefebure whose subalterns are all absent. I had a gunner to take to his troop, who, the moment he got out of my sight, got on my horse's back, which was terribly sore, and was riding with the greatest sangfroid; I was so provoked with the ingratitude of the rascal, for I had already allowed him to put his kit with my baggage, that I took a stick and basted him in good earnest and sent him back to Captain Macdonald. I then proceeded to Villa Velha where I found Bull's troop encamped and dined and slept with them.

[It was on my route to join Sir Rowland Hill's corps that I traversed a good part of Portugal, from Guarda over the Tagus, at Villa Velha by Elvas, in sight of Badajos into Spanish Estremadura. I had only my servant and the extent of country travelled rendered our march difficult and our reception at different places by no means always of the same character. It was in the desolate yet beautiful route between Villa Velha and Nisa that we met with a startling and rather alarming rencontre; full on our route, luxuriating on the carcase of a dead horse, stood in solemn festival 30 or 40 vultures of the tribe called by naturalists, *Vultur fulvus*, each of which when erect might be between three and four feet high. Whether satiated with their meal and gorged into quiescence, or totally regardless of the human presence I could not decide, but there they sat, seemingly in defiance. We were afraid for our animals if not for ourselves, and having loaded a brace of pistols and a double barreled gun which I always had at hand, we made a most respectful detour, leaving the high-road to the birds, who it is probable would have made an attack on our horses and mules, not then in the most robust condition, had they not already revelled too deeply in the same food. It is to be observed that this was a rare occurrence, for unless congregated by the keenness of their scent for prey, these birds are not in the habit of assembling together in numbers. They did not take the smallest notice of us or our preparations, and we were not altogether sorry to get clear of them without a closer intimacy; but I felt the dignity of the human character somewhat compromised, and could not help thinking how likely it was that many a battlefield had been subject to their visitations, nay even that the flesh I carried on my bones might in the future be a dainty with the taste of which they would not be altogether unacquainted.

The route we were then pursuing was certainly one of the wildest yet most beautiful of nature's pathways. The precipitous hill and

rock, the declivities of which as well as the plain on the summit were covered by an uninterrupted mantle of Gum Cistus which perfumed the whole atmosphere and the gushing torrent forcing here and there its silvery way formed, particularly in combination with the view from one beautiful acclivity, an assemblage of natural beauty of a description and extent that no art or cultivation could ever hope to imitate. I have often since reflected on the internal condition of the Portuguese nation. All its provinces, except the Alemtejo, have yet to be submitted to the hand of cultivation. In spite of a beautiful climate, endless means of irrigation, a soil producing every species of grain and Indian corn, vegetables and fruits, a population more destitute of the means of comfortable subsistence cannot well be imagined. I leave it to philosophical speculation to unravel the causes why this country has not yet assumed the position in the agricultural world which providence might seem to have assigned it. I will however hazard two conjectures, the one that its social and political institutions are not favourable to the development of individual energy, and the other, that its fame and predilections have always rather led it in the pursuit of distant discovery and, for a time, of colonization, whereby its own inexhaustible resources have become neglected.

The Portuguese are by no means ignorant of agriculture, as is testified by the cultivation of the vicinities of various large towns and villages in all its provinces, and particularly in the Alemtejo. But the extent of the land under cultivation in so old a country is particularly small, its rocky and mountainous surface only in part accounting for the fact. I was soon however to pass into Andalusia where the well built towns stood as it were isolated in the midst of unenclosed plains vast and gorgeous with the waving corn; justifying the Poet's epithet "the golden harvest," and here too the proportion of cultivation is bounded by the comparative numerical weakness of the population. But the plains and valleys teem with natural fertility, and so great is their extent in proportion to the number of inhabitants, that but little pains are taken to do more than resort continually to new ground. Having taken a crop the land is left and new ground is turned up, so that nature will here produce two white crops¹ without cultivation, and the soil is continually renewing its powers of production after a temporary exhaustion. Most of these grounds are cultivated by the hand, not with a spade, but an instrument used by two men who pass it under the surface and turn the soil completely over. When the crop is gathered it is carried to the neighbourhood of the town, where, on circular stone pavements sometimes natural or else constructed, it is laid to be threshed or rather trodden out by horses or mules driven round in a circle, and thus the straw is cut to pieces and turned into a very valuable kind of chaff ready without cutting; bruised and nutritious.]

23rd April.—Made my march to Alpalhão. At this place I was struck with the difference in the manners of the inhabitants, who when the town was filled with troops the other day were extremely condescending, but now that we had no power to intimidate them, were barely civil,

¹ Any corn crop, such as wheat, barley, oats, rye, or maize.—*F.A.W.*

not even those with whom I laid out my money for bread and what few eatables I could purchase.

24th April.—Determining not to go by the vile towns of Arronches, St. Olaia, etc., I went to-day to Altar de Chão where I found the sick and wounded from Badajoz filling the town. At this place the face of the country begins to alter, and the Portuguese here have a word for cleanliness, sweetness, etc., but of this there are different degrees of comparison.

25th April.—From Altar de Chão with the view of seeing a new place, I bent my steps to Monforte, which is another good town. There was not a single Englishman besides myself and Sutton in the place so that I could not look big. I was obliged to purchase forage as a favour.

26th April.—Went to Elvas in the rain, and after some difficulty from the *Corregedor*,¹ this being the capital of a *Corregedoria*, I got a billet, when I presented it at the house, the landlord or patron, with very great politeness told me he could allow me no wood for my fire, so I with equal good breeding informed him that I thanked him for his extreme civility, in such terms that it even reached his dark Portuguese heart, and he blushed for his want of gratitude and generosity.

I was obliged to buy forage for my horses at a great price as none is allowed to be cut here near the town.

I dined with Fitzpatrick² and passed the evening with Major Macleod of the Engineers and his brother.

27th April.—Remained at Elvas, which is well fortified and rendered strong by having above it La Lippe, a fortress supposed to be impregnable. The possession of Elvas is highly advantageous, and was the only useful article gained by the Convention of Cintra, by which, in common with all Portugal, it was evacuated, having been previously given up by the treachery or undetermined policy of the governor. It has the best market I have seen, all kinds of vegetables, which are rare articles in Portugal, fowls and game. There are many good drapers' shops and many articles of British manufacture to be purchased. The town, like all garrison ones, is close, hot and disagreeable, though the interior of the houses is tolerably good.

28th April.—Set out with a view of getting to Albuera, relying on my knowledge of the country. At the Guadiana I attempted the same ford we had lately passed with the guns, but found it very deep and dangerous from the rapidity of the stream. It was with difficulty the mule and baggage got over; but a donkey that I had bought at Altar de Chão to carry my corn being tied to my mule was dragged through the river, and either drowned or strangled. I missed Albuera and did not get to Almendral until it was dark, and was obliged to bribe some Spaniards to bring me forage, having no corn. At the house where I stopped and where I was well-known and well received by the people, was a Spanish sergeant, a very intelligent fellow, who had been in 18

¹ Mayor or Justice of the Peace. *Corregedoria*, his office.

² Assistant Surgeon Nicholas Fitzpatrick, R.A. (Kane's List No. 64).

engagements. He was enthusiastic in his gratitude towards the English, and expressed it as the common wish of their army that Lord Wellington and English officers should command them, drawing comparisons between the conduct of some of their regiments under English Colonels and those commanded by Spaniards.

29th April.—Got to Villa Franca, where I found Captain Lefebure's troop in high order, but things at a stand-still in this army for the present, Soult having retired on Cordova, and General Hill being joined by 5000 Spaniards.

As we now follow the fortunes of this troop until November 10th, it is not out of place here to say a few words about it.

"D" troop was formed November 1st, 1793. In February 1810 it embarked at Portsmouth for the Peninsula to relieve "A" troop, which had been so reduced by the severe sickness prevalent in the army at Merida after the retreat in 1809, that it was unfit to take the field. The disastrous voyage of a transport carrying one of the divisions of "D" troop, however, caused this plan to be abandoned, and in consequence the troop found drafts for the Horse Artillery with the army and did not itself take the field until April 1811, when it joined the cavalry of Lieut.-General Hill's corps, temporarily commanded by Marshal Beresford. The officers belonging to the troop in April 1812, were, Captain G. Lefebure, 2nd Captain E. C. Whinyates, Lieutenants H. Mallet, T. Carter, W. Dunn, with Assistant-Surgeon W. Ambrose.—*F.A.W.*

30th April.—In an empty house in which I had taken refuge from a storm to-day, after dinner, though let it not be insinuated that Bacchus had any share in making the night dark, I fell into one of the jar-shaped pits with narrow neck and aperture used in this country for storing grain. I was considerably bruised, and at first thought a rib was broken. My situation in the hole was ludicrous enough, for it was quite dark, and I could not get out. At last a Spaniard brought by my cries came with a light to ascertain what had happened; he then got a rope, which being fastened to my body, I was hauled out, to the no small amusement of the bystanders and I myself joined in the laugh most heartily. To escape so little hurt was most fortunate as the fall was 12 feet.

1st May.—We have in our neighbourhood 5000 Spanish infantry under Morillo, and cavalry under the Conde du Penne Villamur.

2nd May.—Rain again set in. Lord Wellington, it is understood, is on his return from the north with 4 divisions, Marmont having fled before him.

3rd May.—I have begun to hope my time is not unprofitably passed, as I now employ myself daily in the study of Spanish, and in reading some book or other, but books are articles which compose so small a part of baggage in this country that I cannot hope to improve myself much.

4th May.—I pasted one of Fadens maps,¹ which my idleness has long neglected. The enemy it appears is breaking up from Seville, at least report speaks of his being actually employed in moving his stores from thence. I cannot help being sanguine in the idea that the taking of Badajos was the signal for the evacuation of the Southern Provinces of Spain, and since all other schemes of my life are deferred though never to be lost sight of, I feel some military ardour in the prospect of the probable events of the campaign.

5th May.—Spent the day in endeavouring to hit a bustard. One was shot by an officer a few days ago weighing 22lbs., and measuring 6 feet from the extremities of its wings; it is excellent to eat and resembles a turkey of which it is denominated the wild species. It is not however at all like it in plumage.

6th May.—A wet disagreeable day, the summer season has not yet made its appearance, nothing can however be finer than the prospect of the harvest here, the crops of wheat, rye and barley all nearly of the same age are luxuriant; little pains is bestowed on the ground which independent of good soil has the advantage of scarcely ever being cultivated more than once in 4 years, as there is such a wide range that the farmers shift their ground. Ploughing is performed by oxen or in some places by mules with one man only: here it is to be observed that the soil is light as well as the instrument so that the labour is easily gone through by one person, and the plough drawn without difficulty by one beast. There are beautiful crops of beans now in blossom, some few peas, but no potatoes, though I should judge the soil to be most congenial to their cultivation. I have not yet seen harrows or rollers, and do not believe them to be made use of. There are large flocks of beautiful sheep on the hills, and from their resemblance to what is called the merino breed in England, I cannot but think that half the sheep imported under that description are counterfeits.

In Portugal they have winter turnips. Their sheep, much inferior to the Spanish breed, do not profit much by this article of husbandry; but the weather is too severe for them to hope to find on the mountains subsistence in sufficient quantity to keep them in condition. Possibly the turnips have become necessary for the support of the oxen, because the cavalry have eaten the hay and straw, but the Portuguese know little how to turn their soil to advantage or their advantages to use. A letter from Edwardes reached me to-day, and one from Doctor Macdonald; the latter states that the French had been in our winter cantonments at Salgueiro, where to use his own expression, "they ground Don Oliviera's corn in his own mill, and carried away all that they could lay their hands on."

8th May.—The army is on its move from the barren climate of the north and hopes are all alive as to our advancing into the heart of Spain and driving its invaders before us. Time will prove.

10th May.—During this last week we have frequently had company

¹ The best of Spain and Portugal of that day, in which all places mentioned in this diary, except a few insignificant ones, will be found.—*F.A.W.*

to dinner, but generally they have been so little to my taste that I have not noticed them much.

11th May.—Wrote to K., and to Harry Forster. I wish to inspire the latter with a wish to come out here, and thereby inoculate him with military ideas, which, though I do not possess many of them, would shine in his possession.

12th May.—Lieut.-Colonel Waller¹ just arrived from England to command our little train in Sir R. Hill's army, dined with us to-day, and what was worse came over at 11 o'clock, so that we had to entertain him or rather assist him to pass the weary hours until 4 o'clock. I may be pardoned for predicting that his plans for the improvement of the corps here will not be attended with success, and I think him a little presumptuous in forming any, especially as they are directly opposed to what experience points out in this country. They are the more objectionable as being in direct opposition to Lord Wellington's, to conciliate whom is the only road to popularity, and by no means incompatible with independence of thought and feeling.

13th May.—I wrote some days of this journal, and having read them over, I am inclined to think my pen has not been guided by the most lively view of existing circumstances.

14th May.—My time did not long hang heavily on my hands to-day as I was resolute to read "Carleton's Memoirs," recommended to me as a book very well adapted for perusal by all officers in Spain, being partly an account of Lord Peterborough's campaign in Valencia, Murcia, etc., in which Captain Carleton served. I found it little calculated to instruct, and as to its historical merits, I could not agree with the praises bestowed on them by the reviewer,² whose eulogy of the book was of course prefixed. Carleton's account of the bigotry of the Spaniards forms a contrast with their present condition, which is now fast approaching emancipation from bigotry and prejudice. In reading it I was forcibly impressed with the benefit some countries derive from revolution, at least, if the effect on the minds of men is considered and the miseries of transient anarchy thought worth enduring for the sake of the light they shed on the national mind. In the persons of Lord Peterborough and Carleton I had a striking instance of the ingratitude of the world, and a proof, not however wanted, to convince me of the unwise choice men make when they launch into the vortex of ambition in preference to sailing in the placid streams of humble and domestic life. This conviction is the more forcible, when we so often find those whose ambition has been laudable, and whose worth has been pre-eminent, doomed to see the untimely end of disappointed hopes, while fools and profligates are guided by fortune to power and affluence.

15th May.—Reading still the page of the hour, viz., "Pasley's

¹ Lieut.-Colonel Charles Waller, R.A. (Kane's List No. 696).

² This remark is creditable to the acumen of Lieutenant Swabey. "The memoirs of Captain George Carleton are now generally believed to be spurious, and perfect specimens of modern myth in which fact and fiction are so interweaved as to produce narratives which are imposed upon the whole world as authentic." "Quarterly Review," January, 1894.

Military policy of Great Britain." I claim however some excuse for so transgressing on military rules owing to the total impossibility of being out in the heat with any safety from 11 till 5 o'clock.

The author of this book has, in plain though philosophical argument, sufficiently demonstrated to me the fatal truth that England's only hope is in war, I should say conquest. It is the peculiar character of his book to excite the pride and awaken the ambition of Englishmen, and by thus touching on man's weakest or next to weakest passion, he tunes his understanding so as to be delighted with the glorious and I may say reasonable plans that he proposes for adoption.

16th May.—Read part of a French work on Tacitus. The style, as far as I went, has like that of most authors of that nation too much vanity and egotism with unpoetic attempt at ornament, so that I have scarcely patience to read it. These attempts are the more ungraceful when made on a subject which should be plainly and concisely treated; repetition is likewise an error too prevalent in French writers. I must admit however the inadequacy of an Englishman's judgment on a French production.

This day was the anniversary of Albuera, and all the regiments here, viz., the 57th, or "Die-hards," 31st, or young Buffs,¹ 3rd, or old Buffs, etc., paid due honour to the occasion by getting what they term Royal rental² of their different exploits, which was as unintelligible as the confusion of tongues.

Apropos of this celebration it should be stated that "D" troop, the only one present at Albuera, played a distinguished part in the battle. On that hard-fought day it was engaged both on "the heights" and in the plain with the cavalry on the right of the position, where owing to the persistent efforts of Marshal Soult to turn that flank some of the severest fighting took place. The troop was in the very thick of the *melée*, the guns were repeatedly ridden through, and many of the gunners charged over by the French Dragoons; indeed for a time one gun was in the hands of the enemy, who however suffered very heavy losses both in men and horses from the destructive fire of the troop. In a letter describing the action dated June 26th, 1811, the cavalry Brigadier-General Long says: "the dispersion of our cavalry scarcely left us more than 400 or 500 British at any point, which with two regiments of Spaniards, that could not be depended upon, was all we had to offer by way of resistance to their numerous and overwhelming columns. The ground, however, favoured us, and the Horse Artillery did its duty with brilliant effect. The enemy lost a great number of men, and from 400 to 500 horses, by the operation of this arm alone."—*F.A.W.*

¹ There appears to have been no real connexion between the two regiments. A legend exists, of questionable authenticity, that at the battle of Dettingen in 1743, George the II. mistook the 31st regiment for the 3rd Buffs, and when the mistake was pointed out, he said, "then they shall be the young Buffs."—*F.A.W.*

² Which probably means they all got excessively drunk, as was usual on similar occasions.—*F.A.W.*

17th May.—Threatened with a march to-day, an occurrence I shall not regret, for I am apt to be desponding when too quiet and unemployed.

18th May.—Marched to Fuente del Maestro an excellent town. From a conversation I had with my landlord he gave me proof enough that many of the inhabitants favoured the French, or rather thought it wise to appear to do so when they were nigh, for he pointed out to me several names of places favoured considerably in the raising of contributions, and when I reminded him of the mild character of the French General who had commanded in some of them, he cleared my doubts by instancing the oppression of the same officer in other places, so that their plans are systematic. Speaking in these remarkable words he decried the imbecility and local tyranny of the Junta, "*Es la Junta que es la perdiciosa de España.*"¹ I never got such a lesson in Spanish politics.

19th May.—At 12 o'clock last night we received an unexpected order to march two hours before daybreak to Azauchal, and there to await orders. We arrived there by 6 o'clock finding the baggage of the Royals and 3rd Dragoon Guards on its way to the rear, the idea was that a squadron of the enemy's cavalry had turned them out of Ribera.

20th May.—Advanced to Torremexia a desolated village with nothing worthy the name of a house. We had a ground floor swept out where horses had been standing, but there were no windows or doors. It seems the force that appeared yesterday was exaggerated by General Slade's account, they having chased his picket from Llera, and absolutely run down 3 horses and taken their riders prisoners. This proves to me that light cavalry are the only people for outposts. I will not commit to paper my ideas on the subject of General Slade's leaving Ribera; it is now again occupied. Close to this town runs a road, or rather the remains of one, made by the Romans and formerly reaching from Merida to Lisbon, these relics of which there are many in Spain are called *Calhada*.

21st May.—Whinyates² and Bent³ went forward to Zafra with two guns as the enemy with an unknown force threatens that outpost.

We received intelligence of General Hill's complete success in carrying the works and destroying the bridge at Almaraz one of the roads to Plasencia over the Tagus; his loss, men killed 30, and 100

¹ It is the Government which is the ruin of Spain.

² Second Captain Edward Charles Whinyates (Kane's List No. 1002), accompanied Sir Ralph Abercrombie's expedition to the Helder in 1799. Afterwards joined the army under the Duke of York, and served in the campaign in North Holland. He was present at the capture of Madeira in 1801. He was adjutant to the R.A. in the expedition under Lord Cathcart against Copenhagen in 1807.

He served with "D" Troop in the Peninsula from 1810 to 1813, and was at the battles of Busaco and Albuera, the affairs of Usagre, Aldea de Ponte, Ribera, San Muños, with many other minor combats.

In the campaign of 1815, he commanded the 2nd Rocket Troop, and was engaged in the retreat from Quatre Bras and at Waterloo, where he was severely wounded. He received for his services the C.B. and K.H., the Peninsular medal and two clasps and the Waterloo medal. In 1852, he was appointed Director-General of Artillery, and the same year Commandant at Woolwich. General Sir Edward Whinyates, Colonel Commandant, R.H.A., died December 25th, 1865.

³ Lieutenant Wm. Henry Bent, R.A. (Kane's List No. 1449).

wounded; of the enemy 250 taken, 300 killed, 200 with the General and his wife drowned in attempting to cross. This movement will embarrass Marmont.

22nd May.—Sir William Erskine¹ sent a patrol of the 3rd Dragoon Guards, our support at this place, to Palomas to learn the truth about the enemy's being in force, the commanding officer of the 9th Dragoons having seen a report of 3000 infantry and cavalry. Sir Granby Calcraft² found their force to be only about 500, and that they had evacuated our line. Had we found them we had orders to move and drive them from the face of the earth, which I felt eager to do, as I was indignant at the idea of a little flying force keeping our outposts in continual and ridiculous alarm.

23rd May.—Received a route to Almendralejo where we were well put up. Colonel Waller dined.

24th May.—Marched to Villa Franca once more, I felt ashamed of showing my face there. We have now no bread, but such as we can press, which is hard on the inhabitants, but I see plainly that if we do not adopt the plan of taking for the use of the troops whatever we can get, we never can advance into Spain. War and charity are two things truly incompatible with each other.

25th May.—At Villa Franca, a terribly hot day, without books or anything for it but sleep and a little contemplation.

26th May.—No intelligence from Whinyates or news stirring to-day.

27th May.—Heard the particulars of the attack on Almaraz. Through various mistakes in the roads owing to the sickness of Colonel Offeney the Quarter-Master-General, the troops did not arrive near the Castle of Mirabete until two hours after daylight, and General Hill supposing that there would be no surprise refreshed his troops on that and the following day.

The next day Mirabete being deemed impracticable by assault, a false attack only was made. In the interim Fort Napoleon was entered by escalade; Lieutenant Love³ of the artillery immediately turned the guns on the fugitives who by an unaccountable oversight cut the bridge of boats on the side to which they retreated and left it to swing round to the other by which means our passage was not interrupted and we crossed over and took possession of Fort Ragusa which with the ordnance, Fort Napoleon and the bridge were all destroyed. N.B.—To destroy ordnance place muzzle to muzzle, or one gun at right angles to the muzzle of another, this is the French system.

“The siege of Badajos having terminated by the capture of that powerful fortress, with all its garrison stores etc., the divisions of the enemy's army retired from the Alemtejo and Spanish Estremadura; the next object of the Earl of Wellington, was to destroy a considerable fortification forming the grand pass at

¹ Lieut.-General Sir Wm. Erskine, commanding the cavalry with Lieut.-General Sir Rowland Hill's corps.

² Commanding 3rd Dragoon Guards.

³ Lieutenant James Love (Kane's List No. 1489).

Almaraz, midway between Badajos and Madrid, 80 miles from the former, 96 miles from the latter, 30 miles from Truxillo, and 60 miles from Merida, situated on the right bank of the Tagus. This, consisting of Fort Napoleon, strongly fortified, with double ditch, and armed with 18 twenty-four pounders, and other ordnance, and connected by a floating bridge with a battery of 6 guns on the opposite side of the river, possessing a numerous garrison well supplied with all kinds of stores, and being in the general route from the grand arsenal at Seville, via Badajos, Truxillo, and Toledo to Madrid, was an obstacle of immediate consideration, the destruction of which was confided to Lieut.-General Sir R. Hill who marched his division from Almandralejo, and issued orders for his 1st brigade to attack fort Napoleon by storm on the night of the 18th or before daylight on the 19th of May 1812." "Storming of Fort Napoleon, Almaraz," by Capt. McCarthy, late 50th Regiment.

28th May.—Wrote away part of the morning. The heat here being excessive, ague and fever begin to make their appearance among the men.

Whilst we were sitting after dinner a man with a musket came running in requesting the help of mounted men to catch some Banditti who had it appeared had escaped from him and 20 Spanish soldiers. Seeing Major Macdonald¹ and Wemys the aide-de-camp² mounted, I got on my horse and joined in the pursuit with 7 or 8 Dragoons. We fairly rode them down after a chase of three miles, one of them firing at and wounding a Spaniard; they did not dare to fire on us but surrendered and were brought into the town. On investigating the matter we found they had regular passports and cargoes on their mules, and it appeared to me that the soldiers who came for assistance had attacked them, but they not choosing to give up their property, had fired and gone off; we set them at liberty.

The abuses committed by the Spanish soldiers are from their manner of obtaining supplies very great, and the civil authority is so inefficient that without soldiery they cannot collect the required rations. They dread the French, who, in case of defalcation on the part of an individual, when a requisition is made, post a sentry at his door obliging him to pay a dollar an hour till his quota is made good, and to feed the whole guard thus let loose on him. In consequence of the difficulty with which the supply of the Spanish forces is attended, they are obliged, to the great inconvenience and danger of the service, to divide armies into small bodies and quarter them in numerous cantonments. The soldiers, deserted by more than the nominal authority of the civil government, enforce their requisitions with the bayonet, and seize on what they can get, by which means more is often levied on the poor than the rich, or at all events no just proportion can be observed. The men employed in pressing mules and transport have frequently

¹ Major D. Macdonald, 92nd Regiment.

² To Lieut.-General Sir Wm. Erskine,

been known, when unauthorized, to press animals for the sake of being bribed to release them, and I have often myself seen them do so. I have never yet known a public-spirited Spaniard come forward to exert himself for the supply of the army, and they are so blind as to prefer the chance of their bread, flour, etc., being embargoed, and themselves reduced to want, to a general submission to the necessity by which they would all equally contribute. It is notorious that in the trifling circumstance of cutting a field of barley for the horses, the Alcalde, or magistrate, is bribed by the rich to spare their lands in the selection.

29th May.—Whinyates and Bent returned from Zafra and General Hill re-crossed the Guadiana.

30th May.—Rode to Almendralejo to get money, in which I failed, and am again penniless! Colonel Waller slept. Maxwell returned with me to dinner.

31st May.—Nicosunir passed through for General Hill. Supposed to convey intelligence that Ballesteros had taken Soult's military chest containing contributions and money from France.

1st June.—To-day exceedingly sultry.

2nd June.—In consequence of a report coming from General Slade of a squadron of the Royals being attacked at Llera two leagues in our front, we were ordered out with the 3rd Dragoon Guards to support them, and marched two leagues; but the enemy would not let us get to him so that we returned in the evening to our quarters.

3rd June.—Marched to Fuente del Maestro to be cantoned there—got excellent quarters.

4th June.—The first time in my life that the King's birthday (George III.) passed without some celebration. The Spaniards have it I believe from good authority that Ballesteros has defeated Soult in a general engagement. He is retiring from Seville.

5th June.—The heat very great, and sick list increasing.

6th June.—Still at Fuente del Maestro.

7th June.—Head-quarters moved to this place. No confirmation appears to be received of the news about Ballesteros.

Ballesteros had gained no success but on the contrary had been defeated. "Having obtained money and supplies from Gibraltar to replace the expenditure of his former expedition against Seville, he marched with 8000 men against Conroux, and that Frenchman, aware of his attention, induced him, by an appearance of fear, to attack an entrenched camp in a disorderly manner. On the 1st of June the battle took place, and Conroux issuing forth unexpectedly killed or took 1500 Spaniards, and drove the rest to the hills, from whence they retreated to San Roque. This defeat of Ballesteros at Bornoz, enabled Soult to reinforce D'Erlon, and caused the allies to fall back gradually towards Albuera." Napier, Vol. V., pp. 61 and 63.

8th June.—Morillo and the Conde Penne Villamur advanced by Usagre to Maguilla and Llerena.

9th June.—I read Spanish to-day and kept as much as possible indoors, the heat being terribly oppressive.

10th June.—Spent this day much the same as yesterday.

11th June.—Marched at 6 o'clock in the morning to Sancho Perez by Los Santos, they are both very good towns. I rode from Sancho Perez in the evening to the famous town of Zafra, the centre of trade in these parts. When I mention trade I do not mean anything but domestic trade; here are jewellers' shops, and every article is to be purchased. In the church at Zafra there is a very tolerable picture of the crucifixion. The convent has been rendered fit for defence by the French, probably against the Guerrillas, since it is pierced all round with loop-holes for musquetry, if assailed by cannon and regular troops it must soon fall.

There is an order to-day, to register for each brigade a certain number of Lemonade¹ (*sic*). These fellows are Galicians, and perhaps the most extraordinary pedestrians in the world. From the rapidity of their journeys we suspect them to be spies for which reason a certain number are registered and allowed, all exceeding that number are taken up.

12th June.—Marched at 3 o'clock in the morning for Bienvenida where we learnt the unwelcome intelligence that General Slade and his brigade, the Royals and the 3rd Dragoon Guards, had been beaten by an inferior force of French Cavalry under Lallemand. The affair took place on the banks of a ravine running between Maguilla and Valencia de Torres and was principally owing to the following circumstances: the Conde de Penne and General Slade were to move in concert on Azagua to drive in the French Cavalry; Lallemand was on the road making a reconnaissance. General Slade's advanced Squadron charged by order; the enemy's advance however did not wait to receive them, and in an unprecedented and shameful manner every man of our brigade broke to pursue. Lallemand saw the confusion and immediately came on with a small reserve when the consternation was so general that our brigade did not rally as it ought to have done, but took to its heels, and lost 164 in prisoners instead of annihilating the whole of the French whom they nearly surprised for they found them on the edge of a ravine which can only be passed by files. This is the first instance of English cavalry being defeated. In consequence we remained in harness all day and at 3 o'clock marched to Usagre where we encamped in the open plain in the sun and remained all night.

[When I was with Sir Rowland Hill's corps in the summer of 1812, a Brigade of Cavalry commanded by Major-General Slade was very much compromised with some French Dragoon Regiments at a spot between Maguilla and Valencia de la Torres; their meeting was nearly

¹ The word should probably be either *Lamonados* meaning inhabitants of a plain without stones, essentially a Galician word, or *Limonados* used locally for bullock drivers.—*F.A.W.*

accidental, and both immediately forming charged. The result of the onset was entirely in favour of the British, but the more cautious Frenchmen had kept a squadron in reserve, whose aid not only retrieved the fortune of the day, but turned the tables against the seeming victors. Several prisoners were taken. I was sent the next day with a light dragoon officer, who afterwards fell at Waterloo, to enquire the fate of some of the parties, for this isolated affair had made no change in the general disposition of either army. Not many days before we had been driven out of the place whither we now repaired with a flag of truce, and I was well-known amongst the inhabitants.

When we arrived at the outposts, handkerchiefs were tied over our eyes, a ceremony which, though performed with the greatest civility, was totally unnecessary on this occasion. We were carried to the General Officer's quarters, ascertained that all due care was taken of some wounded men and officers, and set on foot their exchange which was afterwards completed. By the time this was done it was nearly sunset and we were persuaded to remain to dine and sleep. There was nothing very extraordinary in this for there was always great rivalry in generous civility between this part of the French army under Count d'Erlon, Drouet, and Sir Rowland Hill, and the exchange of prisoners was carried on between these officers when it was not in any other part of the Peninsula. But the circumstance gave me an opportunity of witnessing the different manner in which we and the French comported ourselves towards the Spaniards. True it is that we did not stand to them in the same relative position, but be that as it may, we paid for all we wanted with the most scrupulous punctuality, were imposed upon and quietly submitted; but what said my French General when he sat down to dinner? He found fault with the quality of the wine which I soon perceived was supplied by requisition on the Alcalde, which righteous functionary was immediately apprised by an aide-de-camp that the safest thing he could do would be to send some better, a piece of advice with which he forthwith complied. A good understanding being thus restored, it was next proposed that messages should be sent through the small town to propose a dance to its fair inhabitants, this however was done not in the form of an invitation but as a requisition. The ladies came indeed but were grievously incensed, and for a long time positively refused to dance with any but the two English officers. This was a dilemma the probable consequences of which I did not like much to think of, but firm they remained in their resolution, till at last we persuaded an old lady to make a request on our behalf that they would comply, which some but not all of them did. They had possibly nothing to fear from the French officers, but we were extremely glad to get away at an early hour in the morning; the fair ladies themselves probably experienced individually no ill treatment, yet I was told afterwards when the place again fell into our hands, that the inhabitants were ever after viewed with little favour. It was a place so unfortunately situated that the slightest change of position laid it open to being alternately occupied by either party, and I have no doubt that after a time the inhabitants were as tired of the one as of the other, though the ladies always exhibited a preference for us.]

13th June.—Was ordered with two guns on picket duty on the road from Usagre to Villa Garcia. General Long¹ took compassion and gave me a dinner. A squadron of the 13th under Major Boyce went to Maguilla and brought in 12 of the wounded of the heavy brigade left there by the enemy. We took an aide-de-camp and the French took two of our officers. Ferrier of the 3rd Dragoon Guards lost his horse, and a man of his troop in the most noble manner gave him his, saying "your presence Captain is of more consequence than mine," and he was by that means able to ride off; the man was taken prisoner. The Count d'Erlon treated our people with the greatest kindness and every assistance was given to the wounded; he gave the two officers money, and they both are to be exchanged for the aide-de-camp.

14th June.—We marched to Bienvenida one of the best towns I have entered, I was so pleased with the people in whose house I was, that I stayed talking to them till 12 o'clock. The Spaniards keep very late hours and always are gay in the evening, sleeping in the middle of the day and rising very early.

15th June.—At 2 o'clock this morning I was turned out in consequence of the Spanish cavalry falling back and retiring on us. Sir W. Erskine wanted to fight to-day with the enemy's cavalry, but after standing till 3 o'clock we were ordered to proceed to Los Santos, where with much difficulty the 9th, 13th, ourselves and a brigade of infantry got in. Yesterday Strenowitz Sir William Erskine's aide-de-camp being out with 50 men on the same errand on which Major Boyce went, fell in with 70 of the enemy's cavalry and charged them with 15 men, the rest being in reserve. He gallantly put them to the rout, bringing in 18 men and another of Lallemand's aides-de-camp. Our men consisting of the Royals and 3rd were glad to revenge themselves; one of them left the ranks as on the former occasion, and Strenowitz cut him down, or he might have been in the same scrape as Slade.

16th June.—The Enemy advanced by Villa Garcia.

17th June.—At Los Santos, the enemy still collecting in our front.

18th June.—Retired to Fuente del Maestro, the infantry having already retired to the wood at Albuera. The inhabitants are everywhere employed in carrying their valuable effects to the houses that are usually occupied by the French general officers where it is protected; this circumstance proves, if any proof were wanting, the rapacity of the French soldiery. I saw one woman carrying a door to a neighbouring house fearing it might be taken for firewood.

At Fuente I had my old billet. The people were in great distress; they said they would not care what privations they endured, if we would beat the enemy, but they are now certain of losing their harvest. Though most reasonable accounts speak of the enemy's having 3000 cavalry and from 15,000 to 16,000 infantry, our force is nearly—

British infantry	5500	British cavalry	1500
Spanish infantry	3000	Spanish cavalry	500
Portuguese infantry	500	Portuguese cavalry	200
	<hr/> 9000		<hr/> 2200

This perhaps will turn out incorrect.

¹ Brigade-General R. B. Long commanded a brigade composed of the 9th and 13th Light Dragoons and the 2nd Hussars, K.G.L.

The French force is composed of Soult's and Drouet's corps and perhaps part of Suchet's;¹ they are said to have a considerable quantity of artillery. We have 4 brigades, Captain Maxwell's 9 pounders, our troop, and 2 Portuguese brigades with 2 Spanish guns.

19th June.—Marched at daylight through Azeuchal and encamped at Corte de Pelas. The enemy still pressing on.

It seems probable the following occurrences took place while Lieut. Swabey was with "D" troop, we therefore insert the account here.—*F.A.W.*

[I cannot tell whether all Military Doctors are the roguish fellows that some I have met are, nor do I know whether it is a general practice for soldiers to hold Courts Martial on each other; there are some crimes however which they deem dishonourable; biting for instance, when a man ought to stand up in a ring for a fair fight like a Briton, and the punishment of these by such sentences I have sometimes known winked at, while such a Lynch law has not always been without its uses. A fellow who used his teeth in this way was sentenced by his comrades to lose four of his front ones, two above and two below, and the Farrier who was not contemptible in the art of dentistry was to carry out the decree. He however got shy and the Doctor was applied to, who very improperly varied the sentence by taking all the teeth out in a row from one jaw, a method which he said would render the culprit far more powerless for mischief than if the offending teeth had been extracted as it was proposed. The matter somehow was not known at the time and the Doctor escaped the punishment he would infallibly have met with had he been reported. The love of mischief is so great in some cases that no fear of consequences seems sufficient to prevent its indulgence.

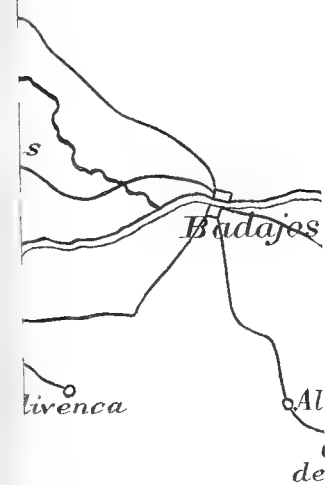
I remember once when I was in the face of the enemy, and the Doctor probably with the baggage, though he loved a skirmish next to extracting a ball or amputating a limb, that I was so afflicted with the toothache that I could not satisfactorily to myself perform my duty. The son of Vulcan however was there, who certainly ought to rank higher than the son of Æsculapius, so I called for his assistance, and being laid on my back the offender was extracted, whether by hammer and tongs or whether by the key instrument now long repudiated by all skilful dentists I cannot tell, but the disease which was very likely occasioned by a certain nervous irritation, which the smell of a Frenchman might have occasioned in a person of extreme sensibility, was removed, and "Richard's himself again."]

¹ For his successful campaign in Aragon, Catalonia, and Valencia in 1811, Suchet was created a Marshal and duke of Albufera.—*F.A.W.*

OF SPAN

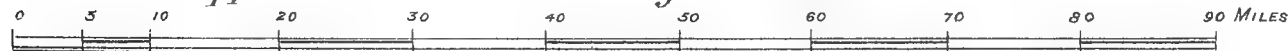
proximate Scale

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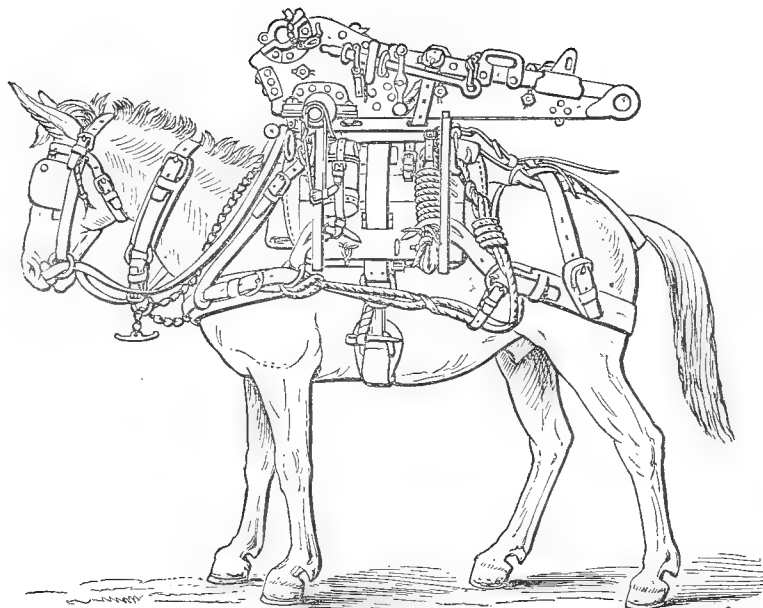
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Approximate Scale of English Miles $\frac{1}{1041920}$

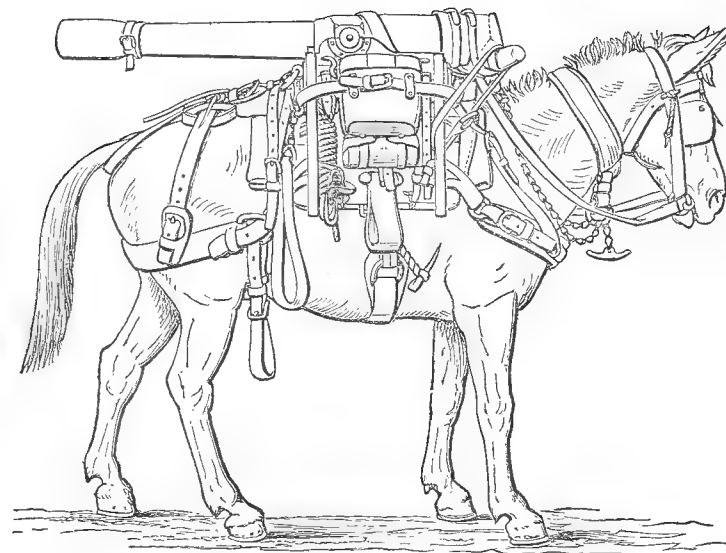




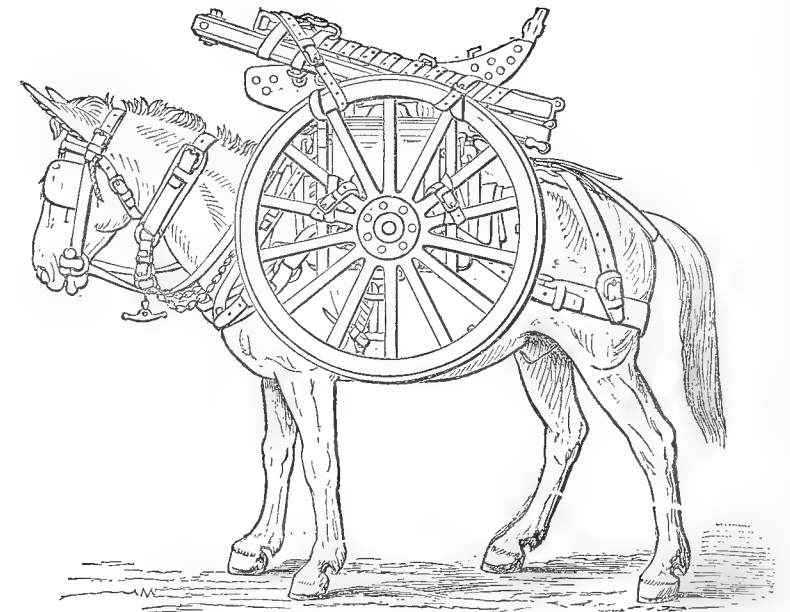
FRENCH MOUNTAIN ARTILLERY.



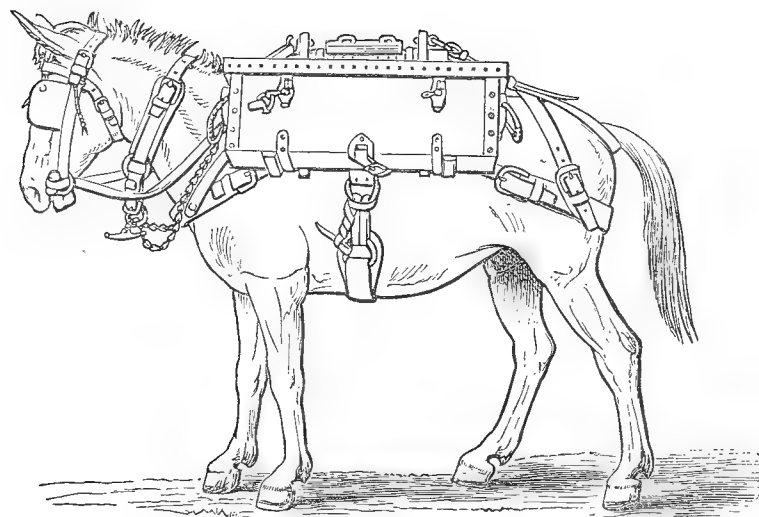
CARRIAGE MULE.



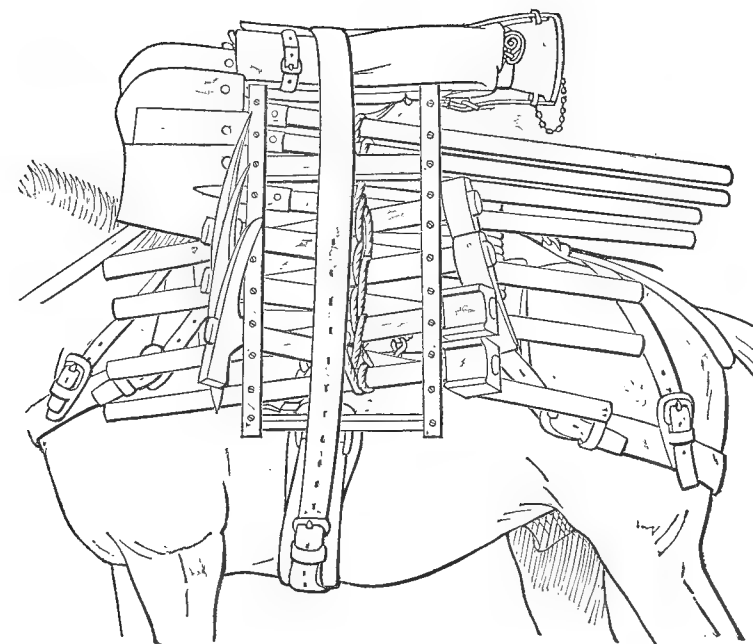
GUN MULE.



WHEELS AND SHAFTS MULE.

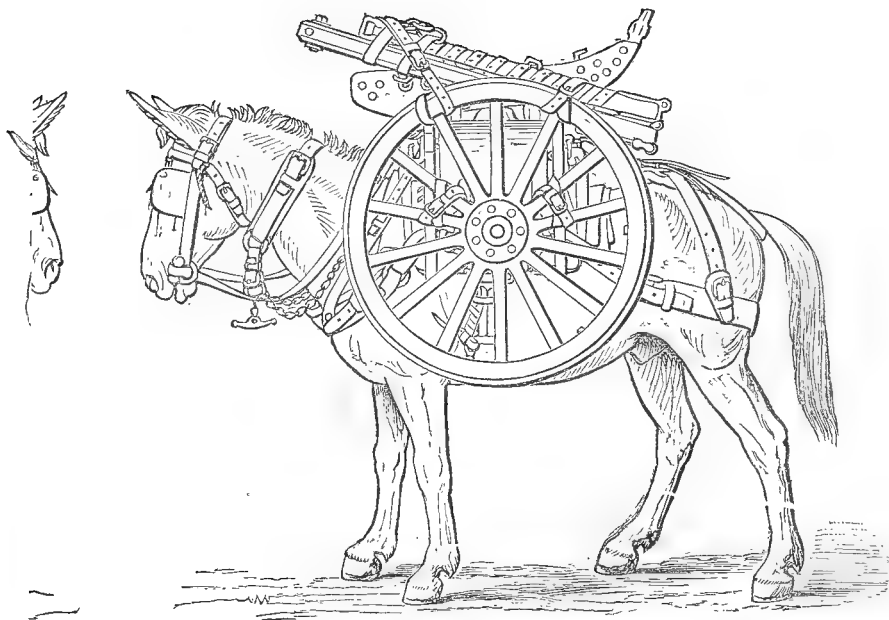


AMMUNITION MULE.

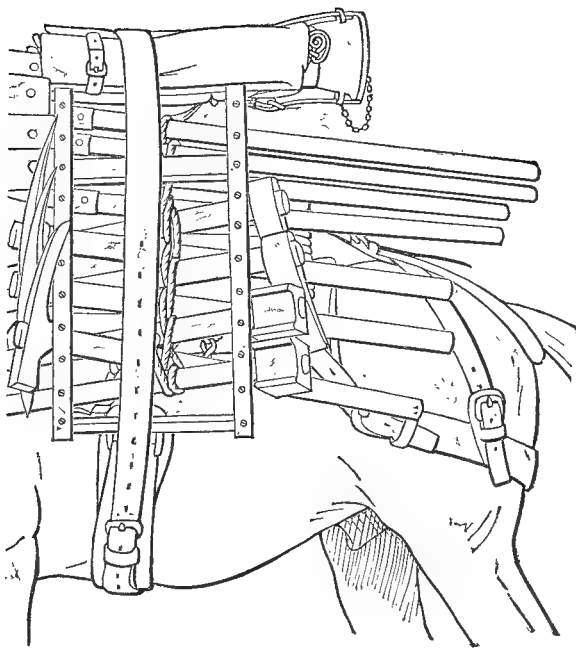


PIONEER TOOLS MULE.

ILLERY.



WHEELS AND SHAFTS MULE.



PIONEER TOOLS MULE.

WITH THE MOUNTAIN ARTILLERIES OF FRANCE AND ITALY.

BY

MAJOR H. C. C. D. SIMPSON, R.A.



THIS paper is an account of a visit I paid this last summer to the French and Italian Alps, with a view if possible, of comparing the merits of some European Mountain Artilleries with our own.

By substituting Russia for France, and Great Britain for Italy, the military problem in the N.W. of the Italian Peninsula is not altogether unlike that in the N.W. of the Hindostan Peninsula.

The principal routes through the Alps on both French and Italian frontiers are commanded by well armed hill forts. The French positions are artificially and naturally the stronger of the two Passes; and whereas the passes from France all converge on one objective—Turin—the routes from Italy to France lead to numerous and in many cases unimportant points.

The slopes of the Alps are steeper and more abrupt on the Italian, than on the French side. I proceeded first to Modane, and afterwards to Oulx, Cesana and Bousson.¹ I received the greatest kindness and civility from all the French and Italian Officers with whom I came in contact, who assisted me in every way in the object of my trips.

My thanks are especially due to the Officer Commanding the 13th (*bis*) French Alpine Group, and to the General Officer Commanding the 1st Italian Army Corps, but for whom I should have seen nothing in each case.

I wish some of my brother officers would also avail themselves of any opportunity of seeing the Mountain Artilleries of other European Powers. Their fixed ideas like mine on these matters, would be rudely shaken. I never saw a greater number of what to us, are golden rules more violated, and yet withal such satisfactory results accrued from the sacrilege.

FRENCH MOUNTAIN ARTILLERY.

On the 5th August at Modane, I obtained permission from the Officer Commanding the III. (*bis*) Alpine Group there to attach myself for two days to the Mountain Battery (the 16th Battery of 2nd Regiment Artillery, Head-quarters Grenoble) of his Group.

¹ All places in the neighbourhood of Mt. Cenis.

ALPINE GROUP.

The other units of the Group consisted of the XII. Regiment Chasseurs-à-pied (Alpine), and a detachment of Engineers, and Medical and Veterinary sections.

There are 14 of these Groups at present on the strength of the French Army, stationed on the Franco-Italian frontier, their duty being in the Alps, to carry out that which in the plains is usually performed by the Cavalry Division, the screening on mobilization of the main bodies concentrating in rear, and in this case advancing by the main valleys on Turin.

On the first day I inspected the camp and billets of the Battery, together with the regimental transport of the Chasseurs.

APPEARANCE AND DRESS OF MEN.

The men of the Battery were housed in one long building, the floor of which was thickly covered with straw and acted as a bed. They seemed according to their ideas comfortable and contented. They are a fine body of men, physique quite as good as our Mountain Gunners, the majority of them mountaineers selected with great care. Their uniform is a sort of loose serge stable jacket, blue with red piping, a light blue cummerbund, khaki trousers, dark blue putties, ankle boots and beret cap (a cap resembling a Tam o'Shanter).

OFFICERS' DRESS.

The Officers wear the usual French artillery dolman, breeches cut like our Mountain Battery pattern, boots ankle, and gaiters of black leather, the latter shaped to the leg and fastened with laces, and hunting spurs, the ordinary sword belt, but on the hillsides sword attached to the saddle, short alpen-stock (like an ordinary stout walking stick with long spike) carried in the hand, beret cap with gold grenade on left side, and binoculars and aneroid (for ascertaining heights) slung over the shoulder.

CAMP.

The mules were picketted in rear of the guns, which with the ammunition boxes are always packed at close interval. They were a very strong and level lot averaging I should say about 15 hands with proportionate girth measurement. The government price varied from £35 to £40 I was informed. The Battery mules were picketted by means of the head chain attached to a broad stout leather throat lash, the other end of chain being attached to a long picketting rope, to which the whole of the mules of one section were attached.

ANIMALS.

The regimental transport mules of the Chasseurs were on the other hand picketted like our Battery mules, by the fore-foot picketting arrangement, which everyone seemed to prefer for mules. Unlike the Italian Mountain Artillery which is formed into a distinct regiment the French Mountain Batteries are attached for administration purposes half to each of two regiments of field artillery. The tendency is therefore to assimilate them as closely as possible to all field

artillery arrangements and methods, whether always suitable or otherwise. The above was an example of "otherwise" they considered. I saw no signs of galls, although the Battery had been undergoing some rough work and long marches for six weeks.

The officers' and mounted men's cobs are the most serviceable chargers for warfare of a mountainous or irregular nature I have seen and much superior to any in our Mountain Batteries whether in India or at home.

SADDLERY.

The pack-saddlery is very roughly finished and dirty, somewhat resembling that of hired transport mules in India in condition. The pads are serge-lined, stuffed with horse-hair. A leather lining instead of serge was being experimented with. There are practically only three different pattern cradles in the Battery. One for the gun and wheel mules, one for the carriage mule, and a third for the ammunition mule, slightly modified for baggage, &c. The side pieces, front to rear arches are deeper and are continued right down to the bottom of the pads, making the cradle much heavier, but doubtless necessary as the loads are heavier than in our Mountain Batteries.

The girth is a single broad leather band passing under the stomach—not girth—and fastened to metre straps on either side like our body rollers with a strip of raw hide to a D on either side with a Hungarian knot. The breast pieces and breechings are similar in pattern to ours, but there are no adjusting chains, and the supporting strap breast-piece is attached to D's on either side of front arch of cradle. All top-loaded mules have a crupper pad provided. The saddles were stacked under tarpaulins in rear of the mules as with us. Blinkers are worn on head collar. Riding saddles were of good pattern and clean.

FORAGE AND STABLE MANAGEMENT.

The forage was good and ration plentiful, similar in quantity to our home ration for 15 hand mules. The mules were clipped and manes hogged, forelocks left and tails not squared. They were all shod. They appeared quiet and well-broken, but were badly groomed. In fact the grooming at stable hour both with French and Italian drivers was for slackness and want of elbow grease quite on a par with that of the very worst native driver I have ever seen. And yet the animals were undoubtedly in good condition.

GUN PARK AND AMMUNITION.

The 6 guns and their ammunition boxes, entrenching tools, &c., constituting the Gun Park were neatly stacked but no tarpaulins are provided for it. The gun is a 12-pr. B.L. on the De Bange principle weighing 220 lbs., muzzle velocity 842 f.s., 3.149" calibre. Height of axis of trunnions from ground about $2\frac{1}{2}$ ft. when mounted. The carriage is divided into two portions at the trail to permit of high-angle firing. A pair of detachable folding-up shafts is provided. The weight of the carriage is about 405 lbs. including wheels. The ammunition boxes are of wood and contain each, 7 shrapnel shell, a projectile weighing with fuze, which is always fixed, but without detonator about $13\frac{1}{4}$ lbs. When necessary a melinite shell of weight slightly less than

the shrapnel is carried in "first boxes." There are 8 cartridges each of 170 grammes of smokeless powder and 10 grammes as primer of black powder, and 10 friction tubes. Eighty-four rounds per sub-division are carried by six mules.

There are 3 sets of wooden racks (1 per section) containing entrenching tools. The racks are as heavy and cumbersome as those just rejected by us in our Batteries in India in favour of the leather rack.

FIELD DAY.

On the 6th I accompanied the Battery in a reconnaissance made by the Group on the Col de Frejus to Croin near the Italian Frontier. The troops marched off at 5 a.m. The order of march of a Group is somewhat as under:—

Advanced Guard 1 Company.	{	Point— $\frac{1}{4}$ section.
		From 150 to 160 yards in rear
		Head. { $\frac{3}{4}$ section.
		Detachment of Sappers. 2 Engineer mules with tools, dynamite, &c.
Main Body.	{	From 150 yards to 800 yards in rear
		Main { 3 sections (throws out also a few flanking files).
		Body. { 1 mule with cacolet.
		3 mules with tools.
Main Body.	{	From 500 yards to 3000 yards in rear
		1 Company.
		2 mules with entrenching tools.
		1 Company.
		"Batterie de Combat" (<i>i.e.</i> fighting line of Mountain Battery).
	{	3 Companies less $\frac{1}{4}$ section for rear-guard.
		Baggage preceded by remaining Battery mules, 100 yards in rear.

Rear Guard— $\frac{1}{4}$ section.

This order of march was not strictly observed on day in question.

The ascent from Modane (3575 ft.) to Croin (8350 ft.) was a steady grind the whole way but not a difficult path for a Battery. The men all wore knapsacks and carried sling carbines and a portion of tente d'abris. In one hand they carried a short alpen-stock. An August sun in South Eastern France is sufficiently trying, but neither men, nor mules for whom there is no relief appeared unduly fatigued on return to Camp at 4 p.m. after only a lengthened halt of two hours from 11 to 1 when breakfasts were eaten, and mules unsaddled and fed.

In all reconnaissances only that portion of the Battery styled the "Batterie de Combat" corresponding to our "gun or fighting line" takes a part. It consists of 31 mules made up as follows:

To each sub-division 4 mules in the following order in "Column of route."

Carriage mule, carrying the body of the carriage which includes axle and elevating gear permanently fixed, drag ropes and on the cradle near side in sling a lantern.

Wheels mule, carrying the wheels, the trail portion, a pair of folding shafts on top of trail. A carriage bearer across the cradle supports the wheels. This load necessitates a certain amount of lashing and a very awkward one, especially when moving through a woody country.

Gun mule, carrying the gun with breech and muzzle caps and lifter, a leather wallet containing small gun stores and a slung case shot.

Ammunition mule, carrying two wooden boxes of ammunition (contents already given).

One mule per section carries entrenching tools.

One mule per section, spare, bare-backed.

One mule per Battery, cacolet.

All mules carry their own stable gear and nose bags, and the blanket is under the saddle. All the loads seemed to have a lot of unnecessary lashing about them.

DRAUGHT.

I was anxious to know the French opinion on the subject of draught in Mountain Batteries. I was informed that draught was required only as a relief when marching on the highroads, where from no variety in the "going," and the hardness and dust of the highway, men and mules suffered considerably more from blistered feet and galls respectively, than in the mountains. It also enabled them when making forced marches in the plains to carry the mens' packs on the unladen mules. Their draught system consists of a pair of shafts one end of which is attached to the trail, the other end (points of shafts) being attached to the gun mule with the carriage mule hooked on in front of the former, tandem fashion. Then follows the ammunition mule carrying the boxes, and in rear again, the wheel mule laden if ordered with the mens' knapsacks, otherwise without load. In action, at drill—which took 2 minutes to come into—the guns were at 7 metres distance from trail to trail, and 15 metres in rear were the first pair of ammunition boxes per sub-division on the ground, and one metre in front of the ammunition mules, the remaining mules of each sub-division were in column in rear of the ammunition mule. The detachment consisted of 1 "Chef de piece"—Gun Captain—and six gunners, one of whom is the layer selected after a 3 months' course and wearing a red grenade on the left arm.

FIRE DISCIPLINE.

The fire discipline is that laid down for the field artillery and not nearly as thorough as our own. Their rates of fire vary from one round a minute slow fire to ten or twelve rounds a minute quick fire. The number of rounds per minute is given by the Battery Commander as a rule. Sometimes when firing with indirect laying if the Commander wishes to assure himself that the direction is correct he orders a gun to fire with time fuze set to $\frac{3}{10}$ th second longer than is correct for the

range. The other guns loaded with percussion shrapnel lay on the burst of the shell fired with time fuze.

Words of command were rarely used, everything in routine, being carried out by the blast of the Battery Commander's whistle when not actually manœuvring or fighting the Battery in action.

The detachments both in French and Italian Mountain Batteries with the exception of layer, who alone kneels, work standing.

What struck me as much as anything was the small amount of ammunition carried by the Battery, that is 14 rounds per gun with the "fighting line" as against our 32 rounds per gun. Their idea is that in mountain or irregular warfare of any kind, the amount of ammunition required, compared to that for warfare of the plains is as $\frac{3}{5} : 1$.

There are 14 Batteries in the Alps, 8 in Algeria and 2 in Tonkin.

The war strength of a Battery in the Alps is 4 officers, 156 N.-C.O's and men, 34 horses and 60 mules. In the Batteries in Algeria there are 82 more men and 73 more animals. The 34 horses of the Batteries in the Alps are partially for the carts which convey along the high road the baggage, rations &c. of the battery, and for mounting a few mounted N.-C.O's. The trumpeters are however not mounted, the farrier acting as mounted orderly when required to the Battery Commander. In the mountains neither officers nor mounted men are mounted as a rule, their horses being led in rear.

The Battery worked well on the hillside but very slowly in handling the loads and coming into action, much behind the Italians in this respect. Drag ropes were put on the top loads by the detachment on ground where it seemed to me quite unnecessary to use them.

When the Battery returned to camp, saddles were taken off at once instead of as with us being left on for at least $\frac{3}{4}$ hour. I saw several stomach swellings from the girth being placed so far back. One officer superintended the stacking of the saddles and another the stable duties which were of a very light order.

I was told that with four field days like this at least, every week, there was no time to devote to long stable or harness cleaning duties, and that the mules and harness were cared for in the same manner as they are in Commerce in France.

With the exception of the Batteries in Algeria against their old foes the Kabyles, and the Batteries in Tonkin, in fighting somewhat similar to our experiences in Burmah, the French Mountain Artillery of the Alps has not yet had the benefit of war experience.

A new edition of the French Manual of Mountain Artillery deals very fully with the subject; it is published in two volumes, the first of which is just issued, and the second, dealing with the organisation and tactics of Mountain Artillery, is expected in the autumn.

ITALIAN MOUNTAIN ARTILLERY.

On August 10th and 11th I was permitted to attend the practice of the 7, 8 and 9 Batteries of Mountain Artillery, on the mountains between Bousson and the Franco-Italian Frontier. These three Batteries formed a Brigade-division under the command of a Major, and at the time of my visit were being inspected by the Lieut.-Colonel in command

of the Regiment of Mountain Artillery, head-quarters Turin.

The Batteries, which had no reservists present, varied slightly in strength but averaged about 100 rank and file and 50 mules. All the 9 regular Mountain Batteries have 6 guns on the peace establishment. The two transformable Batteries have only 4.

The physique of the men was extremely fine; their average height was at least 5' 9", and they were, almost without exception, powerfully built. They wore loose cloth tunics, khaki trousers, and Alpine boots, and were invariably in complete marching order (knapsack, havresack, water-bottle, &c.), throughout the operations. The only weapon carried by the men was the short artillery sword resembling that of a drummer. 24 men per Battery carry a carbine. Under officers carry a long artillery sword and revolver.

The most distinctive feature in their equipment was the aforesaid "Alpine boot," which resembles a short, heavily-nailed "Field" boot¹ and laces in front up to about 8" above the ankle. Similar boots were very generally worn by the inhabitants of the district, and officers and men alike declared that, if well made and fitting tightly round the ankle, it was the best form of foot-gear for mountain work.

The practice took place among the highest ridges between Mont Chaberton and Pointe Rascia, and involved each day a climb of over 3000 feet from Bousson. Both men and mules however stood the work admirably and there were absolutely no signs of distress. As an instance of the physical power of the gunners I may mention that, on the second day's practice, a Battery having taken up its preparatory position at the foot of a knifelike ridge, on the top of which it was coming into action, it was found that the slope was in places too steep and narrow to allow of the guns and carriages being carried into position by three men to each load, as is usually done. Wherever this was the case the gun was promptly shouldered by one man and the trail by another and so carried into action 20 or 30 feet up a steep slope. Each of these loads weighed over 200 pounds, and was carried by a man in full marching order who had just climbed over 3000 feet in two hours.

The mules were of an extremely fine stamp, many *over* 15 hands high and in excellent condition. The saddlery was in serviceable order though with no attempt at polish of any sort. Four mules go to make up a gun-team, and march in the following order and with the following loads.

- (1) Gun-carriage.
- (2) Gun.
- (3) Two wheels, a pair of shafts,² and a box containing gun implements and small stores.
- (4) Two wooden boxes of ammunition, ten rounds in each.

The remaining ammunition mules march in rear of the six gun-teams, each mule carrying 20 rounds.³

¹ It is very similar in pattern to that worn by officers of some of our Mountain Batteries in the Afghan War.

² A very awkward and unnecessary load projecting over the mule's back.

³ Constituting the "ammunition line" as in our Batteries; there was no "relief line" of mules, nor did it appear necessary.

Two sorts of saddles are used, one with an iron cradle on the top, carried by the first three mules of the gun-team as above described, and the other, without the cradle, adapted for slinging the ammunition boxes.¹ The panels are stuffed with straw, with a layer of horse-hair next the mule's back; split leather girths are used and are generally, to English eyes, too far back under the stomach. The gun is a 7cm. ($2\frac{3}{4}$ ") bronze breech-loader by Krupp. Weight 214 lbs. Length 39". Muzzle velocity 840 f.s. Weight of shrapnel $9\frac{1}{4}$ lbs. Charge $10\frac{1}{2}$ ozs. The fuze is a combined time and percussion and is always carried in the shell, the detonator being carried separately and fixed in the fuze when the gun is loaded.

The average weight carried per mule throughout the Battery is 340 lbs.

Shrapnel is almost exclusively used, with percussion fuze for ranging and time fuze for subsequent effect. The number of rounds carried in the "fighting line" of the Battery is 14 common, 56 shrapnel, and 4 case shot per Sub-division.

Owing to the low muzzle velocity of the gun, it is necessary to burst the shell close up to the target, otherwise the effect is lost.

The bronze guns are considered to be fairly good weapons when new, but are said to wear out rapidly. The fuzes also are said to deteriorate considerably after being some time in store. In the batteries now described both guns and fuzes were old, which may to some extent account for the inferior practice made by them. I was told that experiments were being made with a new gun (Nordenfeldt) and that its adoption was shortly expected.

Each Battery had a range-finder, somewhat similar in principle to, but rather more elaborate than, the Weldon instrument. They were however seldom used, as the ground on which the Batteries came into action rarely allowed of a sufficiently long or level base being obtained. There were no men specially classed as range-finders, and on the only occasion on which I saw the instrument used the Battery Commander himself took the range with an error of 600 yards.

An Italian Mountain Battery on service is divided into three units: 1st the "Battery of Manœuvre" (referred to above as "fighting line") of 6 guns, and 74 rounds of ammunition per gun, &c., carried on 4 ammunition mules odd sub-divisions, 3 ammunition mules even sub-divisions; 2nd "ammunition column" of 33 mules carrying amongst other stores, 60 rounds of ammunition per gun; 3rd "section of Park," of 52 mules carrying 150 rounds per gun, 126,400 rounds of small gun ammunition and 1080 rounds of revolver ammunition.

In action the latter is always left on a carriage road, and a mile or two in rear of the Battery. The "Battery of manœuvre" in action has 6 ammunition mules close to the guns, and the remainder 50 to 100 yards in rear. The "ammunition column" if with the "Battery of manœuvre" forms a second échelon 500 yards in rear of the guns.

When on the march and changing camp every day, the mules are picketted in a circle, by simply fastening each animal's collar chain to

¹ The principle of having only one saddle adapted for the carriage of either gun, carriages and wheels appears an advantage over our system of a different pattern cradle for each nature of load.

the head-collar of the animal on its right, so as to leave about 18" between their heads. By this method they are of course prevented from lying down at night, but this is not considered much of a disadvantage; at least, not so much so as to counterbalance the saving of weight in picketting-gear, &c. When however a Battery was stationary for some days the Commanding Officer made arrangements to picket the animals separately.¹

Officers and men slept in tents, those of the men being carried on their backs and those of the officers on two mules allowed to each Battery for officers' baggage. The poles of the mens' tents, both in the mountain artillery and Alpini, are not jointed but are in one piece and are used as alpen-stocks.

The practice was conducted under service conditions, and the nature and position of the targets (which were placed by the Major commanding the Brigade-division) were unknown to the Battery Commanders. On arriving near the place where it was to come into action, the battery was halted and the Commander called up by the Major, who pointed out the target and indicated the position for the Battery. The Battery Commander then took up his preparatory position, as near as possible and under cover, and pointed out the target to the officers and Nos. 1 (who are invariably the gun-layers) during which the Battery came into action and loaded. The guns were then run up by hand or by the shafts to the firing position; the whole system in fact closely resembling our own. After each practice, the officers and N.-C. officers were called up by the Lieut.-Colonel. The Battery Commander then described his performance in detail, giving his reasons for each step. The N.-C.O.'s then withdrew and the Major criticised or commended, as the case might be, and finally the Colonel criticised both the Major's remarks and the Battery Commander's action.

In addition to the above, range reports (of which I was unable to obtain a copy) were made out, both by the Battery and the range party, but these, I was informed, were intended chiefly for the information of higher authority.

An observer was always employed to assist the Battery Commander. He was placed about 20 to 50 yards to a flank, and considerable reliance (which was not always justified) seemed to be placed on his reports.

PRACTICE.

The first practice witnessed was that of the 7th Battery on August 10th. The target, about twenty full-length wooden dummies, represented a section of infantry in line at about one yard interval. The range was rather over 1000 yards, light good, and observation easy.

On coming into action (with percussion shrapnel) the right, centre, and left sections laid with elevations of 1000, 1200, and 1400 metres respectively, and fired rapidly from the right. One shot from the centre section gave a direct hit and time shrapnel was at once proceeded with, without any further verification. About 18 rounds were fired with considerable rapidity, which were all too long and burst much too high, but no attempt to alter the fuze was made.

The 8th Battery practised next, at a similar target but at rather a

¹ By passing head-chains along a long picketting rope, somewhat similar to our method for horses.

longer range. The procedure in this case was different, and elevation given for each gun separately, as with us. A good bracket, of 200 metres, was obtained with the first two shots, but the third shot (laid on the mean of the bracket) which was palpably long, was reported by the observer as a hit. Time shrapnel was at once commenced at that range, without verification, and twelve were fired which were all long though the fuze was reduced twice.

The 7th Battery then fired again, the target representing two guns in action. Petards, intended to represent the enemy's fire, were let off at intervals by the range party, but being placed too much to leeward of the line of fire, they did not obstruct view or observation. In this case the range-finder could be used, and the range, as found therewith, was 2600 metres. Fire was opened with this elevation but the first two shots could not be seen. The range party was then communicated with by signalling and reported that both shots had fallen in a valley, far beyond the target. A bracket was finally obtained after several shots at about 1800 metres. The time shrapnel was however ineffective.

On the second day the practice at a moving target was good. Generally speaking there seemed to be a knowledge of the rules of fire discipline in each Battery, but there seemed to be an invincible repugnance to putting them into practice. This was the more curious as the allowance of practice ammunition (400 rounds per Battery per annum) was quite sufficient to have allowed of a high standard of efficiency being attained. The tactical ideas throughout were sound.

Comparing the Batteries generally with our Mountain Batteries, I think they cannot be classed in any way as equalling our own in equipment, smartness of turn out, rapidity of drill, or artillery knowledge generally, but from being born and bred mountaineers, they excel in hill climbing and capability for lifting heavy weights over our men. The weights carried by the mules exceed those carried in India by our Batteries with the smaller mules. The ground in the Alps was quite as difficult as those portions of the Himalayas in which our Batteries are accustomed to work.

The drivers are all the older soldiers who have gone through the gunners training in a previous year.

"Gun" and "ammunition" lines attend all parades.

There are no separate mules for the carriage of pioneer tools as with the French and our Mountain Artillery, the necessary entrenching tools being divided amongst the mules generally, excluding gun mules. The detachment consisted of 7 men who brought the gun into action in 45 seconds.

Only the officers are mounted, and they rarely use their chargers on the hillside.

The saddlery and turn out generally resembled much in detail that of the French described herewith, and one must have copied much from the other it would appear.

The October number of the journal of the "United Service Institution" gives a very interesting description of the action of the 2 Italian Mountain Batteries (native) in the engagement at Agordat. The guns were too weak to be of much use, and were kept in action too long, whereby they were temporarily taken by the enemy after all the mules had been shot.

TERRESTRIAL REFRACTION AND MIRAGE.

BY

MAJOR P. A. MACMAHON, R.A., F.R.S.

(A Lecture delivered at the Royal Artillery Institution, Woolwich, 7th February, 1895.)

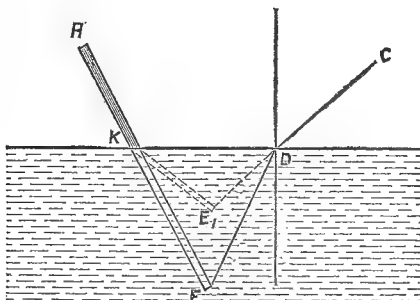
COLONEL C. TRENCH, R.A., IN THE CHAIR.

THE CHAIRMAN—Major MacMahon is kind enough to give us a lecture to-night ; it is not necessary for me to introduce him to you (applause).

MAJOR P. A. MACMAHON, F.R.S.—Colonel Trench and gentlemen, the reason why I undertook this short investigation into Terrestrial Refraction was that a number of inquiries had reached me in regard to the effect which terrestrial refraction might have upon artillery fire. I think, on the whole, the result of the investigation is to show that the facts which are available are of a distinctly reassuring character and this I hope will appear as I proceed.

For the benefit of those who are not very familiar with the subject I will give a short definition of refraction. When a ray of light passes from point to point of a medium which is everywhere similarly constituted its path is a straight line ; but if it passes from one medium to another which is differently constituted or is of a different nature, then, in general, the ray of light will be bent at the surface common to the two media ; and this bending is termed the refraction of light. There are many familiar examples ; one of the most familiar is the bent appearance of an oar in water. If we take the common surface of air and water we have a ray of light, which is incident at a certain angle to the normal entering the water and passing through it closer to the normal, —it, in fact, approaches the normal on entering the water. If we have a rod (*see Fig. 1*) placed in the water the lower portion of the rod *E* is

FIG. 1.



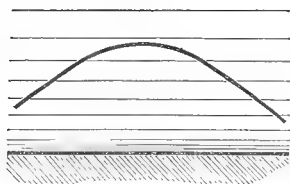
seen by the eye placed at *C* by the path *CD, DE*, there being a bending

at the point *D* and the point *E* is in fact seen by the eye at *C* in the direction *CD* in which the ray enters the eye; it thus appears in the position *E*. On the whole the rod appears bent into the form *HKE*. The property possessed by different media, which causes the ray to be bent in passing from one medium to another, is termed the refractive power of the medium, and in passing from one medium to another whose refractive power or refractive index is greater the bending of the ray is always towards the normal; but in passing from one medium to another which is less refracting, the bending of the ray is always away from the normal. In particular if a ray passes from a vacuum into air of a certain density then the ray is bent towards the normal, and is thus bent to an extent which depends upon the density of the air; and if a ray passes from air of one density to air of greater density then again the bending is towards the normal, whereas if the path of the ray is from air of a certain density to air of less density, then the bending of the ray is away from the normal. It happens that the earth is surrounded by a spherical envelope of air which is not all of the same density. There are two principal causes which militate against the uniform density of this air; one is barometric pressure and the other is temperature; there are other possible causes that we will touch upon later. The barometric pressure diminishes from the surface of the earth upwards, and if the question of temperature did not enter at all, there would be a gradual diminution of the density of the air from the surface of the earth upwards. As a matter of fact the temperature largely modifies the state of the air in many cases. As a general rule—that is to say under normal circumstances—the temperature diminishes as we rise from the surface of the earth and this has the effect, to a certain extent, of diminishing the variation in density, but it has not a sufficiently counteracting effect to cause the density to be anything like uniform. The density of a given volume of air depends upon the pressure to which it is subjected and upon its temperature, and any work on heat shows how the density may be determined when once the pressure and the temperature are known. The refractive power of the air, or the refractive index, can be shown to be sensibly proportional to the excess of the number expressing its density over unity; if the letter ρ represent the density of air, the refractive power can be shown to be proportional to $\rho-1$.

We may consider the air to be stratified in horizontal layers; it is in reality, of course, stratified in spherical layers, but it will suffice for our present purpose to consider it to be stratified in horizontal layers, because the sphericity of the earth is not at all the principal cause of the terrestrial refraction; terrestrial refraction would still exist if the earth had no sphericity, or if its surface were perfectly plane. What we may regard as being the normal state of the atmosphere in Great Britain is a gradual diminution of temperature upwards at the rate of about $\frac{1}{300}$ degree Fahr. per foot, and under those circumstances the density of the air gradually diminishes as we rise from the surface of the earth. The diagram (Fig. 2) may represent, roughly, by the closeness of the lines which indicate density, the normal state of the atmosphere. When a ray of light passes from one point of such an atmosphere to

another point, horizontally distant from it, it takes a curved path as

FIG. 2.

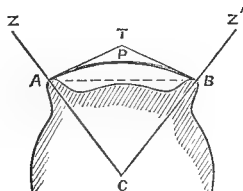


shown, much exaggerated, in the figure. The reason is this: supposing a ray of light to pass in a slightly oblique direction from this point, it is passing from dense air to air which is less dense, and accordingly the ray is bent away from the normal up to a certain point, and then on the downward path when the passage is from a less dense to a more dense air the ray is bent towards the normal; and that brings it down as shown. The ray does not take a path similar to that of a straight line bent into a number of angles, but it takes a curvilinear path corresponding to the continuous change in the density of the medium. It may also be viewed in another manner by having regard to the velocity of light, and to the circumstance that light usually travels in the path that it can accomplish in the least time. In certain cases light travels in the path that it would take the longest time to traverse, *i.e.* in the maximum time path; but those cases do not occur in this particular portion of the subject. In terrestrial refraction light travels in the minimum path, and time is saved in passing from one point to another by curving up into strata of air through which it can pass with greater velocity—the velocity of air being greater in the less dense medium. Accordingly the time of description of this curvilinear path may be and is in fact less than the time that it would take to accomplish the straight path. It will be observed in this case that the path of the ray is curved with the concavity of the ray towards the denser layers, and that is a general principle in this subject. When a ray takes a curvilinear path the concavity is always presented towards the denser side. There is also another principle which guides us, and that is that the amount of curvature of the ray, as measured by the change of direction for a given length of ray, is directly proportional to the rate at which the density of the air changes along the normal. For instance supposing a vertical ray coming down through the strata, the normal is horizontal and there is no change of density horizontally; accordingly there will be no curvature, and the ray will pass in a straight line. But if we take a ray, the general direction of which is horizontal, the normal is very nearly vertical, and that is the direction along which there is the maximum rate of change of density; and accordingly we get the maximum degree of curvature. We get the minimum curvature for vertical rays, the maximum curvature for horizontal rays, and intermediate amounts of curvature for oblique rays.

The way that the refraction is found is as follows: supposing Fig. 3 to represent the earth, and *A* and *B* to represent two places on the surface of the earth, and *AB* a straight line joining them, then *APB* will

be the path of the ray of light passing from A to B . AT and BT are

FIG. 3.



$$\text{Refraction} = \frac{1}{2} (180^\circ + \angle ACB - \angle ZAT - \angle Z'BT)$$

$$K \cdot \angle ACB$$

Mean value of K for Great Britain = .078

Minimum value in summer ... = .05

Maximum value in winter ... = .15

tangents to this curve at A and B respectively; ZAC and $Z'BC$ are the verticals at the two places. The point B , as seen by the eye at A , is seen in the direction of the tangent of the curved ray APB at A —that is to say, in the direction AT , the point B appears in the direction AT . The angle TAB , the angle between the true direction and the apparent direction, is termed the refraction or the angle of refraction; similarly the angle TBA would be termed the refraction or the angle of refraction from B to A . The angles ZAT and $Z'BT$ are the apparent zenith distances of B and A from A and B respectively. In order to determine this angle of refraction at the point A the apparent zenith distance of the point B is taken; that is to say, Z being the zenith at A , the angle ZAT is measured by an astronomical instrument; the angle $Z'BT$ is also measured, and then by a formula, which is attached to the figure, the refraction is computed. We merely want a knowledge of those two zenith distances and of the angle subtended by the line AB at the centre of the earth in order to express this angle of refraction.

This angle of refraction is found, as the result of a great many experiments, to be expressible as a simple multiple of this angle ACB ; that is to say of the arc between the points A and B ; we may represent the refraction as K times the angle ACB . This coefficient, which multiplies the angle ACB , has in Great Britain a mean value of .078 which is very nearly $\frac{1}{13}$; it has a minimum value in summer of about $\frac{1}{20}$, and a maximum value in winter of about $\frac{3}{20}$. According to one authority, exceptionally in Great Britain, this coefficient may be as large as $\frac{1}{2}$; that is to say the refraction may, exceptionally, be half as large as the arc between the two points. Taking a mean value of the coefficient K say $\frac{1}{13}$, this means that the curvature of the ray of light between the points A and B is only about $\frac{2}{11}$ or from $\frac{2}{11}$ to $\frac{2}{13}$ of the curvature of the earth. This fact may also be expressed by saying that the curved ray is a portion of a circle whose radius is $5\frac{1}{2}$ or $6\frac{1}{2}$ times the radius of the earth. Its effect in the normal atmosphere in Great Britain is very small.

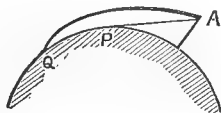
I propose now to examine into the effect this refraction would be likely to have upon artillery fire. A mile on the earth's surface subtends at the centre of the earth an angle of about $52''$. Accordingly, per mile, the refraction will have a mean value of about $4''$, a minimum

value of about $2\frac{1}{2}''$, and a maximum value of about $8''$; and taking a range of 3 miles these values of the refraction would become $12''$, about $8''$, and about $2\frac{1}{2}''$ respectively; and very exceptionally the refraction would amount to about $1' 18''$. The meaning of this is that if we had a range of 3 miles (we will take the exceptional case of refraction of $1' 18''$) and if we were to lay tangent sights upon an object at that distance, a straight line joining the sights would not pass through the point aimed at but would have to be depressed through an angle of $1' 18''$ in order to do so. The curvature of the ray in fact would result in the straight line joining the sights passing over the object, and we would have to depress the gun in order to counteract the effect of refraction. As this correction only amounts to $1' 18''$ it is not a matter of great importance.

There is of course another question besides that of laying a gun by means of tangent sights upon an object; I refer to the use of the depression range-finder. If we take the range of an object by means of this instrument the result will be that the apparent angle of depression will be less than the real angle of depression, and accordingly the depression range-finder would lead to a slight over estimation of the range, and the range as found would have to be diminished in order to get the true range. Of course in the present case with which we are concerned, namely a range of three miles with $1' 18''$ of refraction, that would not be a matter of great importance; but if it were necessary absolutely to eliminate refraction for all practical purposes (and it might be necessary out of Great Britain in tropical climates where the refraction was very much greater than that I have specified) the proper plan would seem to be to employ not a vertical base range-finder, but one with a horizontal base, because lateral refraction is almost non-existent; there are one or two examples of lateral refraction that I will mention presently, but it is almost non-existent. If we were to take our range by means of an horizontal base range-finder, and then to lay the gun not by means of tangent sights but by means of straight-edged sights and quadrant elevation, then, for all practical purposes, we would I think eliminate refraction even if the refraction were very much greater than in any case I have mentioned; and it is for that reason that I do not think this subject of refraction need cause us very much apprehension. The general effect of refraction in Great Britain is to cause a slight over estimation of the range, and, in the case of taking the angle of elevation of the object, is to cause the object to appear rather higher than it really is; but that is not a matter which very much affects us in artillery fire.

One effect of refraction which I will just mention (it does not concern us in artillery fire) is the recession of the visible horizon. Taking a point *A* on the surface of the earth (*see* Fig. 4) just outside the surface,

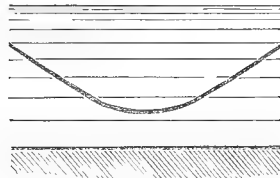
FIG. 4.



the real horizon is found by drawing a tangent to the surface, which would be in fact to the point *P*, but by reason of the curvature of the ray with the concavity presented downwards the point *Q* appears upon the horizon and very often the horizon in this way recedes 10, 15 or 20 miles and even more.

I now come to other cases that may present themselves in the density of the air. The case that we have considered already is that in which there is a diminution of temperature upwards at the rate of $\frac{1}{300}$ degree Fahr. for every foot of ascent. In Great Britain the diminution is very seldom more than about $\frac{1}{130}$ degree or less than $\frac{1}{400}$ degree Fahr., but in other climates it is different. If the temperature were to fall at a more rapid rate, the air would be very much more nearly of uniform density, and that would result in a smaller curvature of the ray. If the fall were at the rate of about $\frac{1}{50}$ degree Fahr. for every foot of ascent, it would result in the density of the air being uniform, and there would be no terrestrial refraction at all. This state of the atmosphere we might represent by lines drawn at equal distances apart. A more rapid fall of temperature still would cause a rise of air density upwards, and that would cause a curved ray with the concavity presented upwards as shewn in Fig. 5. In such a case, where the density increases upwards

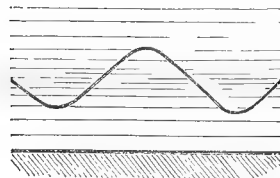
FIG. 5.



and the concavity is presented upwards, the refraction is said to be negative, whereas in the case that we had formerly the refraction is said to be positive. On the other hand a rise of temperature upwards causes a rapid diminution in air density in ascending, and this causes the ray with the concavity presented downwards to be more curved and, in the extreme case in which the rise of temperature upwards is at the rate of $\frac{1}{16}$ degree Fahr. for every foot the curvature of the ray would be the same as that of the earth, and in that case (which of course would never actually present itself) we would be able to see completely round the globe simply because the ray would encircle it.

Again climatic conditions may lead to another distribution of the density. We might get a gradual rise in density upwards to a certain stratum of maximum density and then a diminution of density upwards; in which case you might represent the state of the atmosphere as in Fig. 6, then the ray of light would pass in a curious sinuous path with

FIG. 6.



the concavities presented towards the denser layers.

Some of these cases of extraordinary refraction appear when we come to study terrestrial refraction in the plains of India. I have taken a great deal of pains to obtain correct information in regard to this matter. I have been in communication, written and verbal, with General J. T. Walker, R.E., lately Superintendent of the Great Trigonometrical Survey of India, who has given me much information which I have drawn upon for this lecture in case it might be useful to those serving in India. I have also had assistance from General Tennant, R.E., who was employed for many years on the Great Trigonometrical Survey of India. He has written me some interesting letters giving me his experience of refraction both vertical and lateral.

General Walker carried out some experiments in India in the Plains of the Punjab for the express purpose of determining the extent of terrestrial refraction. He selected stations from about 9 to 13 miles apart; at those stations he erected towers, and on the towers he placed the theodolites and heliostats, he determined the zenith distances and then computed the refractions at various hours of the day and times of the year. The observations were very good as observations, because all the collateral circumstances were noted; the indications of the barometer and of the dry and wet bulb thermometers at the stations, and all the climatic conditions were duly noted, so that the results were extremely valuable. The circumstances that were found mainly to affect terrestrial refraction were in order of importance the following:—

- (1) The time of the day.
- (2) The temperature.
- (3) The aspect of the sky—whether cloudy or sunshine; and
- (4) The humidity of the air.

The time of the year was late Autumn and Winter, that is to say, the time of year in which there is much artillery practice in India. In these experiments the average height of the rays above the ground varied from 19 to 40 feet. From General Walker's tables which are found in the account of the Great Trigonometrical Survey of India I have gathered the following indications:—

- (1) Negative refraction—that is to say, with the concavity presented upwards—was only met with between the hours of 1 p.m. and 3.30 p.m.; and the maximum negative refraction met with was $\cdot 09$, that is $\frac{9}{100}$ of the contained arc between the two points, so that the maximum negative refraction met with was not of very great importance.
- (2) Positive refraction was met with from 3.30 p.m., and through the night to 10 o'clock in the morning; it was greater during the night than in the day time, and the maximum was about $\frac{6}{10}$ ths of the contained arc; that is much larger than anything we consider possible in the case of Great Britain, and that maximum positive refraction occurred at 7 a.m. After this hour of 7 a.m. the refraction rapidly diminishes until at 10 a.m. it amounts to only about $\frac{1}{25}$ of the contained arc.

- (3) Between 10 in the morning and 1 p.m. no observations were taken, but it may be gathered that refraction is likely to be either positive or negative but not as a rule exceeding about $\frac{1}{10}$ th of the contained arc.
- (4) During the afternoon the refraction passes through zero from negative to positive, the average time of this phenomenon being about 2.30 p.m.; that is to say about 2.30 p.m. there was a state of the atmosphere in which there was practically no refraction—refraction was on the point of passing from positive to negative. This time of zero refraction occurred earliest on cloudy days and when there was much moisture in the atmosphere, and latest on days of bright sunshine and little humidity.
- (5) I gather that absence of cloud has a tendency to diminish positive refraction, and frequently to convert it into negative. Supposing a cloudy sky and considerable positive refraction, and if the clouds clear away and the sun comes out, the effect generally is to enormously diminish the positive refraction, and frequently to change it to negative. Thus in General Walker's observations in a certain instance on a cloudy day the mean decimal of the contained arc was $+0.046$; but under otherwise identical conditions on a cloudless day this decimal was changed to -0.01 . On another occasion at 1.30 p.m. the disappearance of cloud instantaneously changed the decimal from $+0.042$ to -0.036 .
- (6) As the humidity of the atmosphere increases the negative refraction diminishes, and positive refraction increases. Humidity in fact seems to have the exactly opposite effect to the sudden appearance of sunshine.
- (7) Lateral refraction is negligible except under very exceptional circumstances.

I received a very interesting letter from General Tennant, R.E., he writes: "When the ray passed over damp or marshy ground or water, the case was worse, and often especially in the morning the distortion and fluctuation of images both horizontally and vertically was enormous. I have seen an image wander several minutes with an intermittent motion to one side, and then return, till after long watching we were compelled to give up hope of obtaining trustworthy angles." And again he writes: "I have a vivid recollection of trying to observe a heliostat over part of the Runn of Kutch one morning when my recollection is that I saw it move out of the field and the wanderings were quite 30' horizontally." Such cases however are quite extraordinary, and not likely to be encountered by artillerymen.

The seven indications drawn from General Walker's tables, and in part quoted from his report, are likely to be accentuated in artillery practice on a plain when the average height of the ray is less than the 19' to 40' mentioned.

I finally draw the following conclusions in regard to terrestrial re-

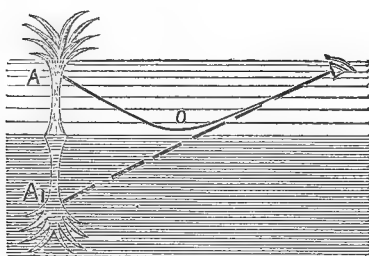
fraction in the plains of India as bearing upon artillery fire :—

- (a) That the best time for shooting is between the hours of 1 and 3 o'clock p.m. when the refraction whether positive or negative is small.
- (b) Taking the extreme decimals of the contained arc to be $+1.5$ and $-.2$, and a range of $2'$ of arc, say $2\frac{1}{3}$ miles, the angular refractions will range from $+3'$ to $-24''$. In these two cases it would be necessary to depress the gun $3'$ and elevate it $24''$, in regard to the line of sight, respectively.
- (c) Therefore I gather thirdly, as my last conclusion, that the consideration of terrestrial refraction in the plains of India is not of urgent importance, because $3'$ is not a very serious matter in artillery fire.

Greater complication and uncertainty arises when we have to fire out to sea from a high cliff in a tropical climate. We might well there have a state of affairs such as is depicted in fig. 6 with the stratum of maximum density at some distance above the surface of the ground, and the observer himself above the stratum. In such a case the path of the ray would be somewhat sinuous, and the effect might be rather serious. I have had great difficulty in obtaining data in regard to tropical climates or indeed in regard to the Mediterranean, Gibraltar, Malta, and such places. I have no satisfactory data to work upon, and it is greatly to be wished that one had more facts to speak about; but it seems to me that in cases where the refraction is likely to be serious, it would be desirable to abandon the vertical base depression range-finder or any vertical base range-finder, and to adopt a horizontal base range-finder, and then to lay the gun, not by tangent sights, but by means of straight-edged sights and quadrant elevation.

I pass on now to consider other effects of extraordinary refraction. We have the effect which is termed mirage. The conditions favourable to mirage are generally a very hot sun and a sandy soil which becomes very hot under the influence of the sun, and an almost total absence of wind. Under these circumstances we have a state of affairs such as is depicted in Fig. 5 and we get quite an extraordinary amount of negative refraction; that is to say, the rays are very much curved and the concavity is presented upwards. We may take Fig. 7 which is no doubt

FIG. 7.



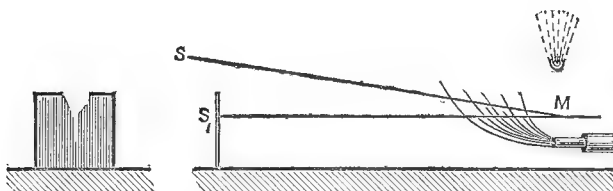
very familiar to everybody because it occurs in nearly every book

that I have seen on physics. The observer sees the top of the tree (say *A*) by means of a negatively curved ray, and accordingly it appears to him to be in the direction of the tangent to the ray where it enters the eye; he sees it in the direction shewn. The other points in the tree he sees in other directions, and altogether the tree appears with an inverted image below it. He also sees the tree erect in very nearly its true position, because the point *A* is seen by two rays, one ray which curves down and another ray, which is traversed in an equal time, which passes up through the denser layers and thus escapes this extraordinary refraction. For this reason mirage is not extremely important from a gunnery point of view. We not only see the inverted image below the object, but also the object itself in very nearly its true position. Now supposing this tree to be standing out against the blue sky, we not only see an inverted image of the tree, but also by curved rays a sky image on the ground in front of the tree, that is to say, nearer to the observer than the tree; and the tree itself appears to be reflected in this sky image, which has very much the appearance of water. This illusion of water is very much increased for the reason, that the surface of the ground being extremely hot there is great convection of heated air upwards from the surface of the ground which gives a trembling appearance to the air, and this causes the sky image which is seen through this trembling air to have the appearance of being ruffled by light waves and ripples. Another circumstance also increases the illusion. The curved rays very nearly follow the path of rays reflected at a plane mirror placed along the surface of the ground, so that objects appear as if they really were reflected at the surface, in what appears to be water, but is really an image of the sky. This phenomenon is very common in Egypt. In Egypt you very often have a great quantity of sand with villages dotted about, and raised to a certain elevation in order to escape the periodical inundations of the Nile; the effect to an observer then is of a number of raised villages in the midst of a huge lake, the lake beginning at a certain distance in front of the observer, say 300 or 400 yards, and then appearing to extend in all directions. It is also common in Australia and in the Plains of India; and in many parts of England in the low lying fen districts, and on the shingle ranges at Lydd.

One very curious thing about mirage is that it depends very much upon the position of the eye; a few inches in the height of the eye may often make all the difference. I remember distinctly at the artillery practice ground at Mooltan in the Punjab at a place called Meeran-ki-Serai there was a very fine mirage; the bushes that were on the plain all appearing like small islands in a lake, and this could only be seen on slightly stooping; by stooping about 6 inches you could see it, but if you did not stoop there appeared to be no mirage. In the fen districts also there is a beautiful mirage, and the other day I understand it could only be seen from the top of a particular wall. It depends upon the position of the eye with respect to the stratum of maximum density whether the phenomenon is very accentuated or not. I was very much interested too in hearing the other day of a very extraordinary effect of refraction from my friend Professor Boys, and I hope he will give

us a description of it presently (hear, hear). There was a very curious effect of mirage also observed at Lydd in the summer by Captain Osborn, R.A. He had been firing with the Maxim machine gun at a target, and during the firing, he observed a wedge-shaped gap in the target, as if a portion of the target had been removed by the hail of bullets, but in a very short time after the firing ceased the target appeared quite whole and undamaged. He communicated this to me, and I think there can be no doubt of the reason of it—it was in fact an artificially produced mirage. The heated gases rise from the muzzle, and form a medium in which the density increases upwards; he was observing the upper portion of the target through this medium and I have no doubt that that caused negative refraction; it caused the bending of the rays so that the sky above the target was seen in the shape of a wedge, something like the shape of the vertical section of the rising gases (see Fig. 8). That is a very interesting case of an artificially

FIG. 8.



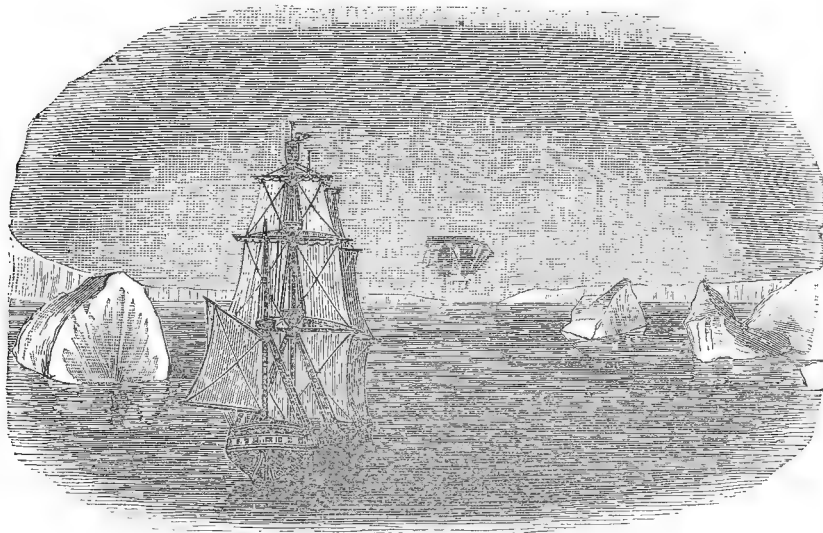
produced mirage, and I think it says a great deal for Captain Osborn's powers of observation.

I have to say a few words about another part of the subject which is called "looming." Distant objects are said to loom when they appear considerably above their true positions, that is to say, when images of them appear considerably raised above their true positions; and the phenomenon is usually accompanied by a great apparent proximity of the objects. The effects of looming are really quite extraordinary, and I have had some diagrams constructed in order to show some of the effects that may be observed. A diligent search has convinced me that the best examples are those recorded by Commander William Scoresby who went on his third voyage in his ship the "Baffin" to the Greenland Whale Fishery in the spring of 1822. He made many observations, and took many sketches of these extraordinary looming appearances. Before describing, much in his own words, these appearances, I will give you his views of the climatic conditions which are favourable to these wonderful phenomena. These are :—

- (1) A rapid evaporation which takes place in a hot sun from the surface of the sea.
- (2) The unequal density occasioned by partial condensations, when the moist air becomes chilled by passing over considerable surfaces of ice. The question is very much complicated by the presence of large irregularly shaped icebergs such as

are shewn in Fig. 9, which must cause very extraordinary dis-

FIG. 9.



tributions of air density, and give rise to quite remarkable vertical and lateral refractions.

- (3) Unequal and changeable density of the air, which of course results in the main from the extraordinary irregular distribution of ice; and
- (4) In the case of multiple images, alternations of parallel strata of different densities in the medium through which the refracted objects are seen.

The diagram (Fig. 10) I have copied from Commander Scoresby's

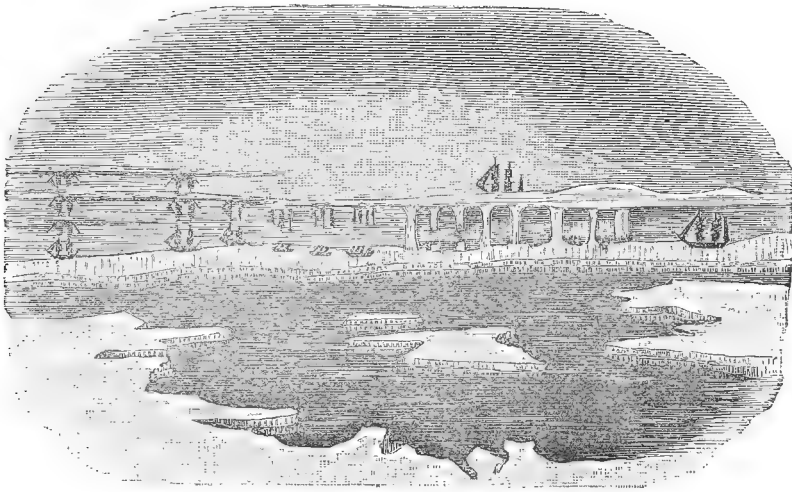
FIG. 10.



book on the subject—his book on West Greenland. The appearances

shewn are the images of distant ice—ice which in the main was quite out of sight or quite beyond the horizon. There was extraordinary vertical magnification; small hummocks of ice were drawn out into spires sometimes of a castellated shape, and sometimes having the appearance of naked trees; sometimes there appeared to be an ice city with public edifices, churches, spires, and so forth, and he notes that these effects were constantly changing; they were never the same for two minutes together. There is no ship present here; it is merely a very extraordinary effect of the refracted ice. In Fig. 9 we see his ship the "Baffin," and his look-out man at the top of the mainmast; he saw a curious inverted image of a ship in the sky raised considerably above the horizon. Now that ship was so distant that it was not even in sight, a powerful telescope showed no ship; its mainmast was entirely below the horizon, and yet he observed this extraordinary appearance. These pictures represent only what was actually seen through a powerful telescope. The image would appear to an ordinary eye simply as a speck in the sky. Commander Scoresby particularly states in his book upon this matter that you get these beautiful appearances mainly when you search the horizon with a telescope. Fig. 11 depicts a remark-

FIG. 11.

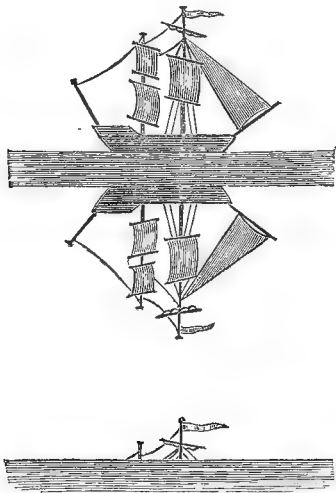


able case in which there was much shipping near the horizon, and beyond that a great deal of irregularly distributed ice, and he observed a great multiplicity of images. One ship is represented with three images above it, all three inverted, and with images of ice corresponding to each.

Other observations that are very interesting were made by Dr. Vince of Cambridge at the beginning of the century at Ramsgate; he observed with a telescope from a point raised 30 or 40 feet above the sea, from the top of a cliff in fact, and he searched the horizon with the telescope, and this is what he found and recorded. There was a ship

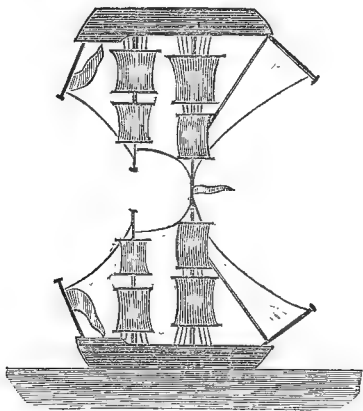
(Fig. 12) almost out of sight with its mainmast appearing above the

FIG. 12.



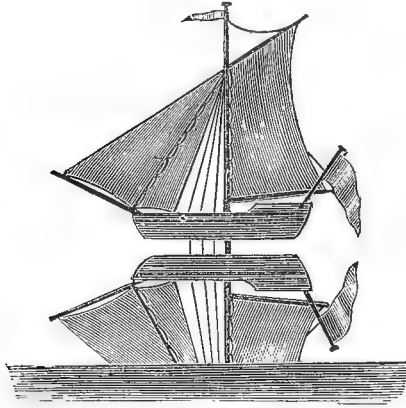
horizon. Above in the sky he saw first of all an inverted image of the complete ship; and then an image of some sea, and above that an erect image of the ship. As the ship sailed along these images sailed along with it, and as the ship gradually got further and further off, the mainmast gradually sank still more, and as it sank the images rose; but, as he writes, the ship did not disappear absolutely from sight, and he did not observe in what manner the images finally disappeared. These effects were observed through a telescope magnifying about 30 or 40 times, so that they could not have been observable by the unaided eye. Then again he saw a ship on the horizon with an inverted spectre of a ship above it, with the mainmasts joined in the manner shewn in Fig. 13.

FIG. 13.



In Fig. 14 the real ship seems to have been completely out of sight, and he saw the inverted ship with a portion of the image, as it were, below the horizon; the top of the mainmast was not visible; and then above this an erect image of the ship. This is one of the most

FIG. 14.



curious cases of looming that I have ever heard of. In another instance (Fig. 15) the hulls of the two images were joined; there was no sea

FIG. 15.

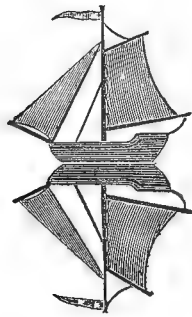
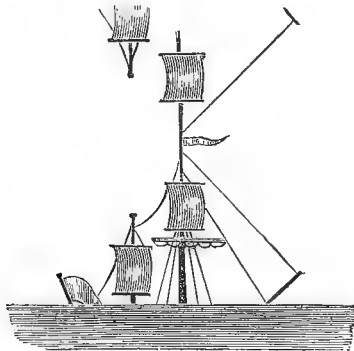


image between them.

In another remarkable case he saw a ship (Fig. 16) with its hull

FIG. 16.



below the horizon, and above it fragments of the sails which were con-

stantly changing, as he says, like the beams shooting out of the Aurora Borealis; the images sometimes ran up, and a number of sails appeared, and then vanished, and only one or two would be seen; and he says that it was very entertaining watching this very curious image above the ship through the telescope, it was never the same one second after another. Another case mentioned by Dr. Vince is very extraordinary.

Dover Castle is only visible from Ramsgate in respect of the top of its turrets; you cannot see the whole of it. Between Ramsgate and Dover there is about 6 miles of sea, and then 6 miles of land rising up to a hill which usually obscures the Keep of Dover Castle with the exception of the four turrets. On one occasion he saw the castle on the near side of the hill; the castle seemed to have been brought from the remote side of the hill, and was seen presented on its near side as in Fig. 17; and he explains this by Fig. 18 which however is not very

FIG. 17.

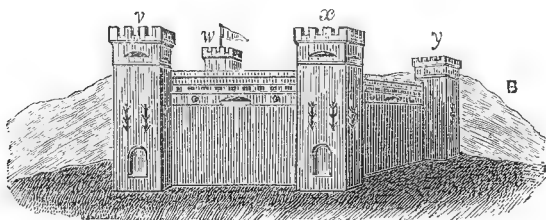
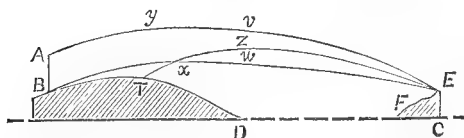


FIG. 18.



convincing to me. He supposes AB to be the castle which is concealed from the point E ordinarily by the hill, and he supposes the rays from the top and bottom of the castle to take the curvilinear paths shewn, and the top of the hill to be seen by means of a ray which passes so as to be between the other two; and he says that you should see really an image of the top of the hill in front of the image of the castle, but that as a matter of fact the image at the top of the hill was so faint that you could only see the image of the castle.

There is only one instance more which I will mention of the abnormal effects of refraction, and that is the most curious case of lateral refraction that I have been able to discover. It was observed in Geneva in 1818. A barque near Bellerive at a distance of 4000 toises (a toise is about the same length as a pace) was seen approaching Geneva on the left bank of the lake, and at the same time an image of the sails was observed above the water which, instead of following the direction of the barque, separated from it, and appeared to approach Geneva by the right bank of the lake, the image moving from east to west while the barque moved from north to south. At first the image was of the same size as the barque but it gradually diminished in size to about one-half when the phenomenon ceased. I think that is very

remarkable: a ship actually coming up on one bank of the lake, and being accompanied by a spectre ship on the other bank.

In conclusion I will only say that I think the result of my investigation into this matter as affecting artillery fire is distinctly reassuring. I think that under normal conditions we have nothing to fear, and I think that under abnormal conditions when we have to fire from the top of a cliff and are uncertain altogether of the distribution of density of the air between the cliff and the object, the difficulties can be entirely overcome by having horizontal instead of vertical base instruments, and by laying the guns with straight-edged sights and quadrant elevation instead of tangent sights.

DISCUSSION.

THE CHAIRMAN—I suppose we all know more about this subject now than we did an hour ago, and I am sure we are very grateful to Major MacMahon for what he has told us and the way he has told it. I dare say some of us have experiences to bring forward, but I think it is very gratifying to know that the Battery Commander of either Field or Garrison Artillery has not to make yet another correction to those he is already saddled with, and that we need not as artillerymen look upon refraction as a serious complication. I do not know whether any gentleman present will give us the benefit of their experiences in the same line. Perhaps, Professor Boys whom we have the pleasure of welcoming will kindly do so.

PROFESSOR C. V. BOYS, F.R.S.—Colonel Trench and gentlemen, I need hardly say how much pleasure it has given me to hear this brilliant lecture by Major MacMahon. The first part of the lecture which dealt with the theoretical branch was given with a degree of clearness and precision which I wish we could more often meet with in London (applause).

Major MacMahon was good enough to mention my name in connection with a mirage phenomenon which was observed in England. I think he made a slight mistake however; for he was told of it in my house the other day by a fellow guest, not by myself. The phenomenon was this: Some people were in a boat at Oxford on the Cherwell on a very hot day last year or the year before, when the grass in the flat meadowland was exceptionally heated and was producing the familiar rippling appearance. A lady in the boat, in the ordinary way seeing nothing peculiar, noticed that on dipping her head almost to the level of the grass—within an inch or two—the cows in the field appeared to rise up in the air while their legs drew out to an enormous length so as to reach the ground. The rest of the party saw the same thing when they put their eyes down within a few inches of the ground, but on raising them the cows became ordinary cows again.

The phenomenon to which Major MacMahon referred as seen over the Maxim gun—the apparent cutting out of the top of the target—was described to me some time ago I think by Professor Greenhill, who as he is here, will correct me if I am wrong. The question arose whether it was not possibly due to those conical shells of compressed air which surround the bullets when their speed is greater than that of sound—photographs of which I had the honour of showing at this Institution some time ago. I do not quite see how those conical shells of air could produce the effect; but it must be remembered that if the target were a considerable distance away, and the gun were firing at the highest rate at which it can fire, some ten shots a second say, there might be several bullets between the observer and the target at the same time, and the eye being probably just about level with the top of the trajectory would be in such a position in fact as to cause the stream of bullets to produce the greatest possible effect.

In connection with the more theoretical part of the lecture, that is to say, that part which dealt with the curvature of light rays in passing through air, in which the refractive power gradually changes, we are able under ordinary conditions in England to observe a very similar phenomenon, one which physically is identically the same, in the case of sound.

When the air is under ordinary conditions, it is well known that it is very difficult to be heard well when speaking out of doors. Now in the case of sound a rise of temperature irrespective of the density is the analogue of greater rarification in the case of light; each causes the velocity of propagation to rise. Under ordinary conditions the air on the ground is warmer than the air above, and the result is that sound rays near the ground travel more quickly than those higher up; and so sound rays are formed with the concavity upwards, so that when a person is speaking on level ground the rays of sound which ought to go to the listener curl up and go over his head, in other words the flat ground between casts an acoustical shadow. On the other hand under extraordinary conditions, that is to say, on a clear quiet night when cooling by radiation is especially effective, the air on the ground may be colder than the air above, and then the rays of sound which start in a slightly upward direction travel more quickly than those going horizontally, curl round, and come down again, while those that go along near the ground bend downwards to the ground are reflected and go up again; so that you have on such occasions a concentration of sound, not only the sound that started in the right direction reaching the listener but other sound that ought to have passed over his head coming down again and reinforcing the other. Then again when there is an excessively gentle wind, so gentle as not to give rise to any turmoil, so that the motion of the air is that of a viscous fluid, the upper regions are moving more rapidly than the lower; and then even if the whole of the air were of the same temperature the upper regions in moving would carry the sound with them more than the lower, and therefore produce the same effect as a higher velocity of sound in the upper regions; and thus it is that on these occasions sound can be heard clearly to the leeward at an enormous distance, whereas to the windward it can hardly be heard at all.

LIEUT.-COLONEL J. R. J. JOCELYN—I should like to say a word on behalf of the garrison artillery. I do not know that I quite share that feeling of reassurance, that the Lecturer gave us, because we have vertical bases in use all over the world, and most of our firing, if we ever have the honour to fire at an enemy, will probably be in the Mediterranean or in a tropical climate, and I cannot admit that the horizontal base instrument is the best way out of the matter. Of course the horizontal base position-finder is an excellent thing, if you cannot use a vertical base; but as you know, it entails more observers and more complication; and also our organisation (I am speaking of garrison artillery) is better suited to vertical base instruments.

At the same time I think that the Lecturer has done very good service indeed, in drawing attention to this matter, in the way he has, because, beyond doubt, the lecture we have just heard should not be allowed to drop; it is much too good a lecture to be allowed to drop; and I hope that it will receive attention.

I may say that a friend of mine who is known to most men here, Major Barlow, when he came back from Rangoon, told me that there was some difficulty there in range-finding, and I believe there was a proposition to build towers all round the estuary in order to put depression range-finders up; and there was a great deal of discussion about the effect of refraction there.

I think Major MacMahon said, he himself is absolutely in the dark, as to what may be the condition of affairs in tropical climates.

Of course with regard to the plains of India that is a question for field artillery, and I hope that I do not offend, when I say, that accuracy of fire is not so important for that branch, as it is for the garrison artillery, seeing that their normal projectile is time shrapnel, at comparatively speaking large targets, while the

Coast gunner as a rule, would fire percussion common, at a comparatively small target, and, being provided with a fixed platform and accurate instruments, every 25 yards is worth considering.

I think Sir we ought not to let this matter stay where it is, but that we should investigate, whether, in tropical places any correction is due for refraction or not. This, I think, could be done, by taking a certain number of observations, with the instruments that we have now, at the datum point; and if records were kept of these observations, we might form some sort of conclusion, as to the effect of refraction. I hope this effect is negligible, but it is no use blinking the matter, if it ought to be taken into account.

With regard to what Major MacMahon said of the quadrant elevation, garrison artillery would always use it unless they were driven to use tangent sights.

I should like to mention one case of refraction that was told us in the Channel Islands, in July last. There is a well defined rock, I regret I have forgotten its name, which was known to be in a certain direction. One day, as seen from Elizabeth Castle, it appeared to be, I am afraid to say, how many degrees to the right or left; I would suggest that reference should be made to Major H. A. Scott, R.A., who observed the phenomenon, because, after the experiences that Major MacMahon has given us I think that that case, of lateral refraction, if it can be substantiated, might be very interesting to record.

LIEUT.-COLONEL R. W. RAINSFORD-HANNAY—I have some diffidence in saying anything after the very scientific lecture that we have had, and after the remarks of Professor Boys; but it might interest you to know something of the practical experience of mirage at Lydd which has been mentioned once or twice. At Lydd there is at times a good deal of mirage. I tried the experiment of having a gun laid on a target at a time of day when the mirage was at its worst. The gun was laid by clinometer and the training and height of the tangent scales were marked. The gun was afterwards laid on the same target with the same elevation and training when there was no mirage and there was no apparent difference. That is explained by the fact, as Major MacMahon told us, that the extent of refraction at home is not more than 1' 16". But there are other things with regard to mirage which make it exceedingly hard to lay when there is much of it. At Lydd last year three field batteries were practising; they began at 6.30 in the morning, and the mirage increases gradually from morning to mid-day. The battery that shot best was the battery that shot when there was the least mirage, while the battery that shot worst was the battery that shot when there was the most mirage.

Another thing about mirage is that the stronger the telescope the more exaggerated is the mirage. The dummies appear like ghosts, a battery using Scott's sights can scarcely see them at all, much less lay on them.

With regard to the experience of Captain Osborn I was myself at Lydd at the time. The range, so far as I recollect, was about 600 yards, and Captain Osborn was trying the Maxim gun and firing as fast as possible. I should say that the height of the eye above the ground was about $3\frac{1}{2}$ feet.

COLONEL R. D. E. LOCKHART—Colonel Trench and gentlemen, it must be very satisfactory to the artillery to know that they need not be anxious about the effect of mirage as regards the laying of field guns; but there is no doubt that it is disturbing as Colonel Rainsford-Hannay remarks, to see these images, and it disarranges the firing very much. But another thing which is a practical difficulty is the rippling of the atmosphere, whether it is to us as gunners upon the plains of Hindostan, or as sportsmen on the highlands of Thibet, so that although there may not be any important obstacle before us there are undoubtedly difficulties that arise in connection with these atmospheric disturbances.

PROFESSOR A. G. GREENHILL, F.R.S.—I feel some diffidence in joining in the discussion on this interesting lecture, more especially as my experience of the subject arises only from the astronomical applications, and not from the point of

view of military requirements. For instance it was a novelty to me to find refraction measured as so many minutes per mile; but the Lecturer made it quite clear why that mode of measurement was requisite for artillery purposes. When we look at the setting sun, and see it just touching the horizon, the sun is really well below the horizon; so that the effect of refraction is to raise the sun up to a distance of something more than its angular diameter; but in that case it would never do to measure the refraction in the military manner by dividing that amount by some 90 millions of miles, the distance between us and the sun.

I had forgotten the conversation that Professor Boys alluded to, but we are very much indebted to him for his beautiful photographs, and for directing our attention to the instantaneous mirage which accompanies the bullet in its flight. This can now be seen, I am informed, when the bullet is flying parallel to a line of palms or towards a clump of trees. It is very noticeable I am told when the bullet is watched through a telescope pointed on the target.

LIEUT.-COLONEL H. S. S. WATKIN, C.B., writes—I much regret that I was unable to be present at the interesting lecture on refraction by Major MacMahon, so I should be glad to be allowed to add a few remarks on its bearing on practical artillery fire, more especially as regards my particular subject range-finding.

The ordinary refraction, and even the extraordinary refraction mentioned by the lecturer, as far as artillery fire either on sea or land is concerned is quite insignificant; the variations of powder, or even of cordite being so much greater. But I can quite imagine that over the heated plains of India, especially when there is a variation of surface, the refraction caused by the numerous heated layers of air will give trouble in laying. This effect can easily be seen on looking at an object through a telescope over a hot water pipe or gas jet. The image moves about and is distorted, I believe owing to the varying refracted rays following one another so rapidly, that the image is seen blurred. I have noticed this at Okehampton and the marshes here, objects seen perfectly clearly when the sun was obscured by a cloud, were quite unrecognisable when the sun shone out and heated the layers of air close to the surface of the ground. I do not believe this blurring will take place, at all events to anything to the same extent over the sea when the surface is uniform. As mentioned by Lieut.-Colonel Jocelyn garrison artillery are not affected, as elevation is almost entirely given by mechanical appliances.

Now as regards the effect of refraction on depression range-finding; it does not seem to be generally known that the D.R.F. is corrected for normal refraction. The amount I took from the text-books on surveying at $\frac{2}{3}$ that of curvature. That being the case the only errors arising from this cause, would be the difference between the refraction allowed for and the actual refraction at the time an observation was taken. This as seen from the figures given in the lecture would be very small. But abroad as hinted by Major MacMahon possibly this error might be of some consequence. Are the results obtained by the D.R.F. therefore to be considered unreliable? I think not, for this simple reason that every time the instrument is set up, this very error is discounted, by laying on the datum point. The datum post as you all know is placed at a considerable *known* distance from the battery; now whatever effect refraction (normal or abnormal) has when taking observations on to the target, it will equally have when setting on the datum post. In this way I believe the effect of refraction is practically discounted.

THE CHAIRMAN—If there is no other gentleman who desires to join in the discussion it only remains for me to thank Major MacMahon in your name for his very able lecture, and at the same time those gentlemen who have made remarks on the lecture which have been most interesting. As Colonel Jocelyn says, the subject must not be allowed to drop, but must be threshed out, and we shall have great pleasure to help in doing so. In your name I beg to thank Major MacMahon for his very brilliant interesting lecture (applause).

ROYAL ARTILLERY BAND.

As it is considered that the following letter will prove very satisfactory to the officers of the Regiment; permission has been obtained for its publication.

“ Horse Guards,
War Office,
29th April, 1895.

SIR,

I have the Command of His Royal Highness the Commander-in-Chief to inform you that His Royal Highness was present at the Concert given by the Royal Regiment of Artillery on the 26th April at the Queen's Hall, and was much pleased with the excellent taste displayed in the selection of the programme and still more with the magnificent execution of the various pieces.

His Royal Highness is satisfied that the high merit attained by the Band of the Royal Artillery is due alike to the interest taken in it by the Regiment at large and to the talents and energy possessed by Cavalière Zavertal and the members of the Band.

His Royal Highness commands me to express his great pleasure in having been present on this occasion, and desires that you will be good enough to convey this expression of approval to the President of the Band Committee and to Cavalière Zavertal.

I am, &c.,

(Signed)

F. T. LLOYD,

To

D.-A.-G.”

G.O.C. Woolwich.

DIARY

OF

LIEUTENANT W. SWABEY, R.H.A., IN THE PENINSULA.

EDITED BY

COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 257, No. 5, Vol. XXII.).)

PART II.

CHAPTER II.

The troops take up position at Albuera. French and Spanish Cavalry. Constant skirmishes. Affair at Ribera. Battle of Salamanca. Sickness. Affair at Majalahonda.

20th June.—Marched to and encamped at Albuera, where we found a position was taken up, having three redoubts, one on the left, one on the centre and one on the left flank of our line. I rode to see them, the position is not very strong but exceedingly judicious, as it is so situated that the nature of the enemy's attack cannot be concealed, and the redoubts, particularly on the right flank, look into all the approaches and I think on the whole cannot be easily turned. There is besides a *retiro* line on the same ground occupied by Marshal Beresford last year. The rivulet running in front can scarcely be termed an obstacle to the attack, but in case of the enemy's being followed it will impede his retreat considerably.

Lord Wellington having moved in the North, great doubts are entertained of Soult's attacking our position, as it appears useless even to beat us unless he does it with a view of securing his retreat. He gives out that he will retake Badajos. We were last year deceived in the amount of the French force which we had undervalued; the same circumstance may again take place, but we can have no considerable odds against us. Received English letters of 19th May, and 1st of June.

21st June.—Still at Albuera, the Spanish cavalry patrolling to Santa Martha, the enemy occupying Azeuchal, Villalba etc. Visited the position again. I find if our right is turned we have a retreat on Albuera, and if the left is outflanked we may march on Olivenca. On a nearer examination of the rivulet I find it of more consequence than I at first supposed, many parts being impassable and others broad enough

to occasion filing and occupy the enemy's time in formation, whilst our artillery has beautiful situations for annoying them. I should mention that the town on our left flank forms a strong defence, standing on a perpendicular declivity and every means is being taken to strengthen it.

22nd June.—Went on picket to the edge of the wood on the Albuera road, and at one o'clock marched with the heavy brigade, now strengthened by the 4th Dragoon Guards, and encamped near Santa Martha having two miles to send to that place for water; we got nothing to eat till very late. The light brigade was skirmishing all night with the enemy's cavalry. It now appears that Soult has not brought up the whole of his force to Azeuchal and no battle is expected. Thus we shall probably advance again into a country where we shall be despised for retreating, yet not deservedly so, because of course our plans are dependent on Lord Wellington's, and we have good reasons for our conduct which are not likely to be known to or understood by the people.

23rd June.—Exposed to the torrid heat of the sun without water and in harness all day and twice called on to move. It was at last determined that we should move to the wood near Albuera, where we encamped by the side of a beautiful river with excellent shade; we were quite in luxury in comparison with the night before.

24th June.—Still in our delightful bivouac; the men falling sick, and Whinyates agueish from the effect of the sun.

25th June.—This day passed with little variation from yesterday.

To enliven us we had indeed a fire in our camp, owing to some sparks falling on the dry grass which immediately kindled and spread and threatened our horses, baggage, etc. This is an accident very common in these woods where everything is parched up and there is scarcely any dew to keep vegetation alive.

26th June.—Still without means of discovering why with a superior force we should give up so fine a country as that we have retired from to the enemy, who are daily employed in collecting the harvest; the natives will of course be left to all the horrors of want.

27th June.—The French to-day made a reconnaissance in force: we were turned out but nothing occurred. We sent forage parties to Almendral occupied by the Spanish infantry, when Morillo refused to allow our foraging though in a regular manner, and turned out his men to resist ours; fortunately our men were unarmed. The Spanish General behaved with great and unjustifiable impropriety in striking and ill-using our fellows who acted with the strictest decorum and discipline. Nevertheless Lieut.-General Sir William Erskine was guilty of a gross dereliction of duty and of acting contrary to the proper feelings of a British officer in listening only to the history given by Morillo, and in censuring our conduct without even hearing what we had to say, though the ill-usage experienced by the men under his command would one would suppose naturally have made him their advocate.

At 6 o'clock this evening I went to relieve Carter on picket with the light brigade of cavalry and supped with General Long.

28th June.—After breakfasting with General Long, who likewise asked me to dinner, I rode by his order to investigate the possibility of guns passing from the picket ground to the Solano road, which I found easy to accomplish. I dined with Handley of the 9th and was relieved, and returned here in the evening after passing last night in my cloak.

I find from my ride this morning that the three roads approaching Albuera are easily watched and that there are excellent look-out stations. The Portuguese and Spaniards take this duty. It appears that Soult has never moved from Seville and that the detachment from his corps is put under Drouet's orders. Ballesteros has again fought with Soult near Seville.¹

29th June.—Still shadowed by the venerable oaks of Albuera.

30th June.—An account was received of Ballesteros having again been engaged with Soult.

1st July.—The French made a reconnaissance to-day on the Solano and Santa Martha roads, which occasioned a smart skirmish with the Portuguese cavalry. After everything was supposed to be quiet, at about 3 o'clock, the Spanish cavalry to the number of 600 came galloping into the wood pursued by about 300 French who took 200. The whole cavalry turned out. The French were so flushed by their success that they had the insolence to come into the wood. The picket of the 3rd Dragoon Guards saved the honour of our camp by gallantly attacking and charging the enemy with 14 files only. Lieutenant Ellis was killed and Captain Watts the other officer severely wounded. My guns were first out of the camp, and I was posted with them for the night at the cross-roads; of course no clothes taken off, and nothing to eat till midnight. In the course of the evening a Spanish dragoon came past my post with a Frenchman, who had been shot through the breast, on his horse. Less cruel than other Spaniards he was conveying him to our camp, but as the man could no longer sit on the horse he asked me what he should do with him as he was repeatedly begging to be killed. I stopped the first surgeon I could find and got his wound dressed, and after refreshing him with brandy and water, put him again on the Spaniard's horse, who promised faithfully to carry the poor wretch to Albuera about a mile and a half distant. An hour after an officer passing told me that he had seen the man lying on the roadside about a mile off, and requested I would send him some assistance. I never was so unhappily situated; my post in front of the enemy I could neither leave nor weaken, and was actually obliged to refuse the least help. I lay down but could not get the Frenchman out of my head and at last resolved to run all risks, so took a horse and man and wandered about for a long time to try and find him and carry him to my guns, where at least the poor wretch could get water. This satisfaction however I could not enjoy as I could not find him. I was made happy afterwards by learning he had found some compassionate creature to take him on a mule to the camp.

¹ At Ossuma near Seville. Ballesteros surprised Colonel Beauvais, took 300 prisoners and destroyed the French dépôt at that place. Napier, Vol. 5, p. 188.

2nd July.—When on picket last night the army advanced at 2 o'clock taking me upon its way. At about 7 we passed through Santa Martha and stopped for the day, without a leaf to shade us, and nothing to eat till dark, and of course no baggage.

3rd July.—We left our ground at Santa Martha at 3 o'clock. General Hill with the main body marching on Los Santos. Sir William Erskine with the brigade of light cavalry including our troop under General Long, and Colonel Campbell's brigade of Portuguese cavalry and 2 brigades of light infantry moving on Villalba where there were some French cavalry. We advanced with the light cavalry rapidly on the place; they however escaped us. We had a great deal of sharp skirmishing with their Hussars and Lancers, and our guns had a few shots at them; one of my shots killed 2 of the enemy but the General officers would not let us go near enough to do much damage. After much manœuvring the whole French cavalry having shewn itself, we marched (still without anything to eat) along the banks of the river Grandajira which passes Villalba till we came to a position in front of Feria, the enemy still manœuvring on our left. We then took up a strong position. At about 4 o'clock some guns fired on the Portuguese brigade, and we with our guns took up a position to oppose them, our howitzer only being able to reach them. We killed seven horses and some men, how many was not ascertained as they were carried off. We fired only four shots, and the infantry that we moved to protect being moved under cover, the enemy withdrew their artillery. One shot only came amongst us, which knocked down a man and horse but was so spent that neither were materially wounded. We did not get off our horses from 2 this morning, or eat till dark. We then retired into a wood and I slept soundly in my cloak.

4th July.—At 3 o'clock was out with two guns on the plain till 4, when all our force marched to join General Hill at Los Santos the enemy having moved on Usagre. We got to the army at 9 o'clock, when I went with the troop to water at Los Santos and was not off my horse or at dinner till 11 at night.

5th July.—At 3 o'clock the army advanced on the Bienvenida road, the light cavalry and horse artillery in advance; coming to a wood on the road a picket of the enemy's skirmished and fled before us. Sir William Erskine's corps now moved to the left on Usagre, where we found a large force of the enemy's cavalry, whom we drove through the town after a sharp skirmish. Had the ground been anything but very stony, we could have passed the town and cut off many prisoners. The troop fired a few shots, and had we been well placed or permitted to use our own discretion we might have done much execution. The enemy retired on Llera, and when we had thrown out pickets, we went through Usagre and encamped between that place and Bienvenida at about 6 o'clock, after which we had to cook before anything was to be had to eat.

6th July.—Turned out at 3 but did not move. This day we had leave to forage and for the first time to take off our harness.

7th July.—The enemy having retired on La Granja and Azuaga,

General Hill's column marched to Llerena and got possession of that pass over the mountains to Seville. We with General Long's brigade encamped for the first time in quiet, and slept in our beds, which was a luxury of such value as only those who have experienced great fatigues and hot suns without rest can appreciate. The hard work and exposure has done much to weaken us by sickness.

8th July.—Shaded in the woods of Villa Garcia. We received the particulars of Lord Wellington's attack on the forts at Salamanca in which Captain Eligé¹ of the Royal Artillery was killed and Lieutenant Love was wounded.

9th July.—Rode in the evening to Llerena where I was admitted by a priest to the private Chapel of the Cathedral; here he showed us with the most ridiculous reverence the relics of Nossa Senhora de Granada the patroness of all Spain.

10th July.—This morning at 3 o'clock our column advanced on Maguilla. On our route we heard General Hill's column engaged towards Berlanga, we hastened to his assistance, but before we arrived he had gained his object by driving the French cavalry out of the place. As they did not retire out of sight we manœuvred some time and did not get off our horses till 7 o'clock. After this our men to their great credit, as they were without orders, foraged for their horses.

11th July.—We retired by Ayllones to our camp at Villa Garcia, but not till we had remained a long time under arms. We got in by 5 o'clock.

12th July.—In consequence of the enemy's cavalry having occupied Berlanga, on our leaving it, yesterday we made a feint of retiring to bring him on, and a design was formed to surprise and attack him. We marched accordingly at 2 o'clock in the morning, but owing to Sir William Erskine's halting us for two hours on the road, General Slade with the "heavies" arrived and waited for us near Berlanga. The heavy brigade was sufficiently strong to have beaten the enemy but were as usual restrained and dispirited. It seems to be the system to do everything to make our fine fellows afraid of their enemy. We are daily harassed in the sun and our ardour is imprudently restrained. We remained in the fields till 1 o'clock when we went into cover at Ayllones for a few hours which we enjoyed in shaving and cleaning ourselves. At 8 o'clock we were turned out to return to our camp at Villa Garcia, where through the darkness and mistakes of the guides we did not arrive till 2 o'clock in the morning.

13th July.—I was agreeably surprised by a letter from Mr. Walcott, and another from the Captain. I was fatigued and knocked up but their receipt reanimated me, and I felt more pleasure and happiness than has been my share since I entered the Peninsula. I immediately set my writing desk on the ground and answered Mr. Walcott's, and wrote to Maurice. No news from the enemy. A letter from Newland

¹ Captain John P. Eligé (Kane's List No. 978) killed 19th June, 1812.

in the North informed me of their howitzer having been employed in battery against the forts at Salamanca¹ when they had three men wounded, viz:—Varley, Clayton junior, and Tyrrell; they have likewise been engaged in the field.

Lord W's head-quarters are at Medina del Campo where he has suspended his advance, It is rumoured that this delay is because Castaños will not co-operate, and turn the passes through the mountains to Madrid, by marching on the enemy's flank.

14th July.—Glad to dedicate the day to rest. I lay in my hut and amused myself with pleasing speculations. I wrote to Yeamans Walcott thanking him for the contents of his letter.

15th July.—There came to-day to Llerena nine deserters from the Poles. It appears that they have taken some general disgust to the service, seven of them were non-commissioned officers. I hear that ten who had been caught were shot by the French for desertion. It is remarkable that last year they served with the greatest fidelity. These Lancers are armed with a long and sharp spike or spear which has a rest by the stirrup. It has a loose sling that passes over the arm and secures it if it gets out of the hand. It is adorned with a flag, and a body of these men makes a very pretty tournament appearance, which effect is quite lost when they are single. They owe their reputation to having destroyed a great many of our infantry when their ranks were broken at Albuera, but as to their being formidable to formed troops it is quite ridiculous; a dragoon with his broadsword is worth two of them. They are very fine men individually, dressed in large loose Mameluke trowsers, and a *Polonais* cap. Exact representations of them are in the London shops.

16th July.—The 13th and 9th went into quarters at Villa Garcia, but we preferred remaining in our shady camp to being crammed into a crowded unwholesome town, and were consequently permitted to do so. Rode to Llerena in the evening.

17th July.—Had company to dinner whose riot and noise was very disagreeable.

18th July.—Having for some time assumed the high dignity of caterer and this day settled my accounts, I find it is a very wearing office. It will teach me to be more regular in accounts for the future, the loss of about £3 per month is no very good speculation.

19th July.—Passed a dull day in the camp a prey to *ennui* and the terrible rays of the sun.

20th July.—Hotter perhaps than ever. Some of the infantry retired this morning from Llerena to Zafra, in consequence of an application made from the inhabitants to lessen their burden.

A courier was intercepted with many letters written from ladies of the best families in Llerena begging their French lovers to drive the English out of the town. These letters ridiculed us and our manners in the most contemptuous terms. This exposure was followed by no

¹ Those of "A" and "I" troops were also employed. They were no doubt the heavy iron howitzers given the H.A. in 1811.

arrests as it ought to have been, but General Hill merely published the letters. The circumstance of a correspondence between a lady and her admirer is considered as unworthy of remark in this country, where intrigue is the order of the day.¹

Apropos of Spanish ladies, the following account of an incident which probably occurred at Villa Franca, where the troop was on and off for upwards of two months is appropriate here.
—*F.A.W.*

[When I was with Sir Rowland Hill's corps the warfare we carried on consisted chiefly in manœuvring, though not so constantly as to prevent our time being spent very agreeably. But the frequency with which places on the arc of the semi-circle in which we moved changed hands must have been trying to the inhabitants whose fidelity however remained unshaken.

I was at different times for some weeks in the same quarters, and in the idleness of the time, of course, like others formed acquaintance with as many fair ladies as would permit or encourage an intimacy. If my readers knew as much of the Spanish character, female as well as male, as I do, they would, which I fear they will scarcely otherwise do, acquit me of all vanity when I recite the following as a characteristic tale. A certain fair girl not more than 16 years of age gladdened the house in which I had several times resided, her name was not poetical, it was Johanna, but to live in the same house and not to have a tenderness for this fair one would indeed have argued an insensibility which no officer of my age could have been guilty of. I doubt not that habited as an Hussar she would have mounted one of my horses and ridden off, as these Spanish girls have done, provided I could have brought myself to swear never to desert her, but I was not for various reasons in that frame of mind nor could I deceive her. All this was distressing enough, but the last visit I made to the place a cousin of hers, "*La traidora*,"² surpassingly beautiful, and whom I used to call Azulia though that was not her real name, was her frequent visitor. This girl was a being not to be viewed with safety or indifference, and Johanna on very slight grounds became ungovernably jealous. One day rushing into the room where I was engaged in innocent conversation with her consin, she stabbed her, fortunately not mortally, and but for my prompt action would have struck the fatal knife (it was not a stiletto) into her own heart. Here was a scene! Soon the fathers,

¹ Captain E. C. Whinyates writing from camp near Villa Garcia, July 20th, 1812, thus speaks of this incident.

"The greater part of General Hill's corps has been for some time in Llerena, a large and populous town. There are a great many 'Senoritas,' *i.e.* young ladies, in it, and these (most wonderful to relate) have retained so much constancy for their French lovers, that although the English have occupied the town a fortnight and have given almost every night balls to amuse them, they still remember their first attachments. A peasant was taken bearing the *billets-doux* of seventeen of these Penelopes to their lovers. These epistles afforded much amusement being written with all the warmth of Spanish passion. How long these fair ones may continue such unheard of fidelity is very uncertain."

² "The traitress."

mothers, uncles, and aunts were congregated, and vengeance vowed against me, the guiltless cause of this catastrophe; the bleeding Azulia however had the most of their compassion, and they became shortly so incensed against each other, that I was overlooked, and in a few days contrived to march off without either fair creature seated astride, as was the custom, on one of my led horses].

21st July.—Marched out of our camp this morning at 3 o'clock for Usagre, where we encamped for the night. We had a heavy thunder-storm to-day.

22nd July.—Marched at 2 o'clock this morning to our old quarters at Villa Franca, I was the first Englishman that got into the place. As it had been much plundered and impoverished by contributions on the advance of the French, I expected to meet no very cordial reception the people however seemed to feel the same indifference as usual.

23rd July.—Have been obliged to return to my old billet, one of the meanest order. I met with the usual kindness from the patrona Isabella, and the rest of the family, but the devil take all houses at this time of the year, the fleas and the mosquitos entirely prevented my sleeping the whole night though very tired.

24th July.—At about 9 o'clock in the morning a report came in from Colonel Campbell commanding the Portuguese cavalry that the enemy's cavalry in force had driven him out of Rivera. We immediately turned out, and after amusing the enemy till about 1 o'clock, we moved to attack them, the Portuguese on the left, the 9th and Hussars on the right, and the 13th on the road in the centre. I who had been left behind with the left half brigade at Villa Franca arrived just as the column advanced and riding forward moved my guns into a position looking over the town on one of the French columns; I immediately came into action, and fired with great precision, rapidity, and effect, owing to the steadiness of the men, and soon moved them from their position, when they seemed to wait for the Portuguese, whose skirmishers behaved gallantly. In the meantime the 13th with our other three guns joined the right column and did much execution on a column that moved out of the town. The villains however would not wait for our charge but moved off in the greatest regularity; we followed them at a trot along the Llera road for about a league, the guns several times coming into action with effect. One of my guns falling to the rear on account of a wheel's being disabled, I led the charge with the other, but from the nature of the ground I never got a shot.

The result of this exploit is the capture of a number of horses and men, all their rations, and some baggage; the road was strewn with rum, bread, and biscuit, and my men got two large sacks of new bread. The most valuable acquisition however is the entire restoration of our confidence. From what I saw in front of the miserable condition of the French horses, I believe had we pushed on we might have made many prisoners. I think on a moderate calculation the enemy's loss may be estimated at 50 horses and about 50 men, of which full 30 were

killed by our shot, or dismounted so as to cause their being made prisoners.

In the evening we returned and got to Villa Franca about $\frac{1}{2}$ past 9, horses fresh and ready for them again. Our loss was a few wounded and three Portuguese killed.

25th July.—Much prouder than I ever felt before in this place, which we have so often left to the enemy. I held my head up and received the compliments of the people.

26th July.—This evening at 8 o'clock we went out on picket which I understand is to be the system pursued: as it is useless at a distance from the enemy, I consider it a harassing order.

27th July.—Returned to Villa Franca at 6 o'clock after passing the night, which was terribly cold, in my cloak, and at 8 o'clock returned as before to the olive grove.

28th July.—Started off to picket as usual having returned as yesterday at 6 in the morning. Reports from Ribera speak of the enemy's being in force at Llera.

29th July.—Received the pleasing intelligence of Lord Wellington's having completely beaten Marmont on the 22nd near Salamanca, under the following circumstances. Marmont had been marching on his flank some days toward Rodrigo, when Lord Wellington took up a position with his left resting on the Tormes, neglecting however to occupy a hill commanding the left of his position. On this Marmont then brought up artillery, and commenced a cannonade, without any intention of bringing on a general action, but to boast of having driven the English back from Salamanca. The enemy's left rather outflanked Lord Wellington, who moved the 5th division, which formed his left, round the rear to his right, and supported by General Le Marchant's heavy cavalry brigade, ordered it to attack the enemy's left flank, and sweep the whole of the height occupied by him, which was done completely. At the same time the 4th and 5th divisions advanced in column on the centre, while the 6th attacked the very rocky height on the right. It was gained by the Fusilier brigade of the 4th division attached to the 6th, but a French regiment formed steadily at the bottom, and advancing upon the brigade, the greatest exertions on the part of the officers could not prevent the Fusiliers falling back without receiving the attack; but supported by two brigades of the 6th division they afterwards rallied, and had the honour of carrying the height.

The enemy were then obliged to quit their position, taking up another in rear, which was likewise carried by the 3rd, 4th, 5th, and 6th divisions with the heavy brigade of cavalry. The brunt of this attack was borne by the 3rd division but it was unable to force the enemy's left. The heavy brigade of cavalry then charged them in hollow square, they being previously much disordered by artillery.

Marmont then retired to a third position his right resting on the Tormes. This was carried and the rout became general, night only preventing the total destruction of the army, 4000 dead were counted on the field besides wounded, 6000 prisoners and 19 pieces of artillery

taken. Marmont lost an arm¹ and Bonnet and another general were wounded. Our loss is estimated at between 3000 and 4000 men. General Le Marchant was killed at the head of his brigade, General Victor Alten of the cavalry, Marshal Beresford, and Sir Stapleton Cotton are wounded.

The charge on a solid square of infantry of the enemy's rear guard on the 24th, was one of the most gallant actions of the war.² The prisoners say the French army is dispirited and discontented.

30th July.—A General Salute was fired in honour of Lord Wellington's success, and we have intelligence of 3000 more prisoners being taken making 9000.

Joseph's army coming up to re-inforce Marmont, had its advanced guard driven in, and when this account came away, he was in full retreat.

We all remained in camp this night, General Hill having ordered a double ration of spirits to be issued to the men to drink Lord Wellington's health. We gave him repeated cheers, but every individual accompanied them by wishing a parallel opportunity to occur to us.

1st August.—We were permitted to return into quarters this morning a change very agreeable to us all.

2nd August.—Confound all dilatory and spiritless Generals! We were this morning under arms at 3 o'clock and having returned to quarters and unharnessed, about 9 when I was in bed, came an alarm and turn out. This was occasioned by the Hussars being attacked in Ribera, into which place though occupied by us, the French had actually sent and ordered rations, promising to come for them.

The Alcalde had consequently prepared them, for which piece of service had I my will I should certainly hang him for not giving us information, notwithstanding that the French whenever they had possession of the place, which is one that must change masters every day, would undoubtedly serve him the same way had he done so, yet justice should be vigorous and the Alcalde is at liberty to fly whenever the enemy advances, then his house and property are burnt, nevertheless I would hang him to intimidate others.

¹ Marmont in his memoirs tome 7, page 116 describes as follows meeting with the Non-Commissioned Officer, then Quartermaster Sergeant J. Wightman, who caused his wound. "Before leaving Ghent in 1815, previous to Waterloo, I wished to see a company of English horse artillery which was there. The English material is so different from what we used formerly, that the comparison was curious. I therefore examined it in detail, and I admired the simplicity of the construction, since adopted in France. This visit caused a singular incident, they presented to me the *Maréchal des logis*, who, on the 22nd July 1812, had laid the gun whose discharge had broken my arm an hour before the battle of Salamanca. There could be no mistake; this fatal wound had been caused by a single gunshot, fired at a certain time at a known spot." I gave this under officer a good reception. Since then I saw the same man at Woolwich where he was a store keeper, [Lieut. Invalid Artillery] when I was there in 1830, to visit that magnificent arsenal. Then however he had only one arm, having lost the other at Waterloo. In condoling with him I said, "my good fellow each has his turn."

² The charge was made by the heavy cavalry of the K. G. Legion under Major-General Bock. "Bock was near sighted, and not being aware of the proximity of the enemy, when Lieut.-Colonel May, R.A., brought him the order to charge, added, after expressing his readiness to comply; but you will be good enough to show us the enemy." To this request Colonel May readily assented, and gallantly accompanied the first squadron in the charge, where he was severely wounded. When afterwards relating the circumstance, the gallant Colonel was wont jestingly to add: "That is what I got by playing the dragoon, and leading the Germans." History of King's German Legion, Vol. II, page 82.

On the approach of the enemy who had four squadrons and 400 infantry, the Hussars who had only two squadrons behaved most gallantly charging them three times. Major Bussche repeatedly sent to Sir William Erskine for support, who instead of pushing on, unwarrantably delayed the troops, and left him to retire as well as he could with the loss of an officer and 20 men killed, wounded, and taken prisoners, besides about ten of the 9th likewise killed and wounded, and he actually halted whilst 4 squadrons of cavalry and 400 infantry were doing what they pleased in Ribera, though he had the Hussars, the 9th and 13th Dragoons, 3rd Dragoon Guards, with our guns; and he might have had the 71st regiment 700 strong. As it was the 71st regiment did not arrive till after the enemy had retired, but the force was adequate without, and no danger could be apprehended from their infantry. If we had advanced and looked into the town, in case of the enemy's retiring, we should have killed half their infantry with our guns, and if they had not thought proper to retire in face of them we should have delayed till the 71st gave an account of them.

The transaction is altogether calculated to dispirit the soldier, discontent the officer, and take away all confidence in the General, whose conduct must be generally ridiculed and despised.

The Portuguese infantry under General Campbell behaved very differently the day before yesterday at Zafra, where a similar attempt was made with about the same force by the enemy, General C. placed his men in a wood, so as to allow them to pass and get the rations, and on their return he fell upon and made prize of them all killing, wounding, and taking prisoners about 60.

3rd August.—Disgracefully abandoning our post at Ribera, we now only keep our outpost in the wood on the road.

5th August.—Ambrose and Lefebure being already seriously attacked by typhus fever, and Whinyates ill with the ague, and Carter with a bilious complaint, I fell sick with the fever, which by timely remedies I thank God I got rid of before night, as its consequences are very alarming. I was extremely fortunate in knowing what it was and arresting its progress. No news.

6th August.—Sutton sickened to-day with the fever, which likewise threatened me again towards evening.

7th August.—I woke this morning with the most violent and insupportable pain in my head I ever felt, which having endured for some hours, at last turned into a fit of the ague, which I was extremely glad to change for the apprehensions that an alarming fever occasions. Mr. Peach of the 9th Dragoons who attended me, made me immediately get into water during the hot fit, and repeat this operation several times. The getting into water in a fever makes one shudder almost as much as if told to get into a furnace. One of the worst of my complaints was the total want of money, so that I could not even get fruit and wine, that were particularly recommended. When the fit left me after 8 hours, I began to feel a wish to be quietly reposing in some cool spot in England, and it brought to my remembrance every tender recollection and regret. Sickness is at any time bad, but under all my

circumstances and with the probability of the army's moving, in which case I could not have stirred, it put me in mind of French prisons, Bayonne and all its horrors.

8th August.—I employed an interval of comparative health, only to wait the coming of the fever to-morrow.

9th August.—I lay the greater part of the day in indescribable agony from pain in head and eyes, but rallied, and by order of the surgeon, rode out in the evening, though scarcely able to sit on my horse.

10th August.—The fever did not return to the charge again to-day, and I swallowed oceans of bark to prevent its effects to-morrow, as I was already much weakened.

11th August.—My attack to-day was so much slighter, that I made up my mind to go to Zafra to-morrow for change of air.

[It was previous to the Salamanca retreat in 1812 that owing to the extensive sickness which prevailed in Sir Rowland Hill's division, I was detached from my own people to assist the reduced number of officers in another troop. Ague degenerating into typhus was the prevailing malady. The Spaniards are scarcely ever free from the former. "*La calentura*," which I suppose might mean any fever, was a daily visitor in every house large or small, none escaped its visitations, and this appears always to be the case and not a peculiarity of the time or circumstances. With us, unless when a man was attacked on the march, and in that case it often turned to typhus, it was easily cured by Peruvian bark with which the medicine chests were largely supplied. The natives seemed to consider it as a component part of their constitutions and shivered and burnt alternately with the most laudable resignation, and except when we gave it them seldom employed any antidote. Years after however when my military days were at an end, I had a footman who had been a soldier in the 3rd Dragoon Guards, and who had a recipe for ague given him by a Spanish priest. This effectually distanced in its effects all the medical skill in the neighbourhood where I lived during a prevalence of this lingering complaint, which is very frequent in English country parishes, and though not often immediately fatal disposes the sufferer to dropsy, typhus, and many other serious disorders].

12th August.—In the cool of the evening I left Villa Franca, Lefebure and Ambrose to cure themselves, and rode over to Zafra, where I had previously sent to secure a billet, and accomplished the ride with tolerable ease.

13th August.—My disorder to-day was so slight that I congratulated myself on having so soon got rid of a bad business.

14th August.—Being much strengthened, I rode this evening with Captain Maxwell into the mountains, when all on a sudden, in the valley between two large sierras, we came to an immense lake, on which the moon was shining, the whole forming the finest night scene I had ever beheld. I was at a loss to account for such an accumulation

of water at this time of the year, when scarcely a brook is to be found between the Guadiana and the Mediterranean. Upon enquiring of the inhabitants, an immense stone dam was pointed out to me, built across the bottom of the valley and confining the water, which was let off by flood gates to different mills, which, I was informed, grind the whole corn of this part of the province, and I thus had a riddle explained which I never before could understand, for I had often wondered how the wheat was ground in a country where there was no water, or wind to turn a mill, or other machinery to supply the defect. They were now hard at work to get all the corn ground before the water evaporated as they could not even spare what was daily sucked up by the sun. It is needless to add that the water is thus collected in the rainy season.

15th August.—To my great joy this, which was the returning day of my fever, passed without its making its appearance.

16th August.—Continuing to amend, I ventured to write to Catherine an account of my illness.

17th August.—General Hill reviewed the troops here this evening. Intelligence was received of Lord Wellington's entering Madrid, amidst the acclamations of the people. The *Retiro* and the *Plaza de Toros* had been fortified, but capitulated and two thousand prisoners were taken.

18th August.—Intelligence was received of Colonel Skerrett's brigade consisting of three British regiments and some Spaniards and Portuguese having landed at Ayamonte.

An expedition was fitted out consisting of 3500 Spanish troops under General Crux, and 1500 British and Portuguese under Colonel Skerrett with a view to attack Niebla. The troops landed at Huelva, on the coast not far from Ayamonte, at the mouth of the Guadiana, on 14th and 15th of August, but the French evacuated and destroyed the castle on the 12th. Wellington Despatches, Vol. IX., page 380.

19th August.—It appears undoubted that General Maitland¹ is in Murcia or Valencia with 10,000 British and Spanish troops, his object is Barcelona which is very strong.

Lord Wellington has established an extensive magazine at Carthage.

20th August.—No extraordinary occurrence happened to record; this day like many others.

21st August.—Feeling myself sufficiently recovered I rode over this evening to Fuente Cantos, whither part of the troop had removed. The French made a strong recognisance of our outposts from Ribera to Almendralejo. Two deserters came in and three *Juramentado* officers; these rascals are Spaniards that have sworn to fight for King Joseph. Their oaths do not seem to be very burdensome when they find their cause diminishing in popularity.

¹ Landed at Alicante on the 3rd August.

22nd August.—I received to-day the unwelcome intelligence of the misfortunes of my poor troop in the North. It appears that the 7th division, Macdonald's troop, and some Portuguese cavalry superior in number to the enemy's cavalry that skirmished with them, were to enter Madrid. The cavalry and horse artillery were in front, and the French Dragoons formed to charge, when the rascally Portuguese though nearly double the French turned tail and ran back on Macdonald's guns, and so mixed with them that he could neither fire nor retire, and lost 3 of his guns, the carriages of which the enemy burned and the guns were spiked. Dyneley was taken prisoner and many men, their behaviour was excellent and received the just reward of praise from their General. In sympathizing in their misfortunes, I could not help envying them the glory they acquired, and the opportunity of conducting themselves nobly.

Brereton¹ joined the troop from Cadiz to-day.

The disaster to "E" troop referred to occurred the day before Lord Wellington's troops entered Madrid. The following extract² from a letter written by Captain Dyneley on returning to Madrid after his capture and escape elucidates this affair.—*F.A.W.*

"Very shortly after I sent off my letter of August 9th, we received orders to march at 2 in the morning. The troop accordingly moved forward about 2 leagues on the Madrid road and halted.

At the request of the German Colonel Commanding,³ I accompanied him about a league to the front for the purpose of reconnoitring the enemy. As soon as their rear guard opened fire upon us, we retired upon our advance and remained waiting further orders which arrived at 3 p.m. directing us to advance immediately as far as it was safe; we did so until our vedettes were driven in, and then halted in the road for the night.

¹ Lieutenant William Brereton (Kane's List No. 1258) served in the Peninsula, France, and Flanders from December 1809, to June 1815, including the sieges of Matagorda, Cadiz, (wounded) and St. Sebastian; battles of Barrosa (wounded), Vitoria, the Pyrenees, Orthes, Toulouse, Quatre Bras and Waterloo (severely wounded); at the affairs of San Munos, Helette, St. Palais, Sauveterre, Aire, and Tarbes.

He was second in command of the expedition under Major-General D'Aguilar in 1847, which captured the forts of the Bocca Tigris in the Canton river, those of Staked Barrier and at Canton, spiking 879 pieces of ordnance.

He was on board the flag-ship *Brittania* during the naval action of the allied fleets with the defences of Sevastapol, 17th October 1854, and directed the rockets fired from that ship against the forts and city. Lieutenant-General Sir William Brereton, K.C.B., K.H. received the Peninsular medal with 6 clasps, the Waterloo, China, and Crimean medals. He died July 27th 1864. By his will he left a handsome legacy of £1000, to the Royal Artillery, "the interest upon which to be expended in maintaining the game of cricket, to be played by the N.C. officers and privates of the Royal Artillery at Woolwich."

² This extract is from a very long and amusing letter which with others it is hoped to give *in extenso* in the "Proceedings" at some future date.

³ Colonel de Jonquières: in the absence of Major-General Bock commanding the allied cavalry vice Sir Stapleton Cotton wounded at Salamanca, he commanded the German Legion heavy cavalry brigade.

At daylight next morning, the 11th, we discovered the enemy's cavalry drawn up about half a league in front of us. We advanced and they retired over nearly two leagues of ground, the Colonel constantly asking me if they were within range, to which I replied 'no, no, no sir.' At length I asked him if he would allow one of his Regiments to accompany my guns to the top of a hill down which the enemy's cavalry was then going, and to this he immediately agreed. Off we set at a trot, from that to a gallop, then to speed, and reached the hilltop just as they got to the bottom, opened fire and put them to flight in style; they made for the town of Las Rozas and drew up to make a stand, but we advanced and drove them through the town.

Soon after Macdonald with two guns came up and took command of the whole troop. We then again advanced and drove the enemy for nearly half a league before us, when they made another stand. I went on with 2 guns and moved them from their position, and after firing 6 or 8 rounds they retired altogether, leaving us about half a league beyond the town of Majalahonda. We remained here about 2 hours and then received orders to go into the town and make ourselves comfortable.¹

Harding and I soon found a house, got breakfast, lay down and had had nearly 3 hours sleep, and were half dressed again when our Commissary came into the room and said, 'they say the French are coming on again.' I took this very quietly, but rather hurried my dressing. In a short time a Portuguese officer put his head into the window, frightened out of his life, and stuttered out, '*Muito grande e feroz cavalaria franceza—vega, vega pela janella, Senhor Capitão—com os seus canoes, muito brava, brava, brava.*' As soon as he had taken his departure, I put my head out of the window and sent a man to tell the Trumpeter to 'sound out' immediately. All the horses were in the stables; some of the men drawing rations, others getting their horses shod etc., however, considering everything, they got to the alarm post astonishingly soon.

Not a soul knew Macdonald's house, nor could he be heard of in any direction; so as soon as 2 guns were ready, my friend Harding and I went away with them at score to the front, and directed the rest to follow. Just as we got clear of the town Macdonald joined us, he had been asleep in his quarters and by great luck the noise awoke him. He gave directions for the other guns to take the right road and we took the left, the Portuguese cavalry being drawn up between. We had no sooner gained the ground from whence we opened our fire than I saw how the thing was to go with us. The Portuguese wavered, and I turned to Harding and said, 'The French will

¹ The German cavalry went back again to Las Rosas leaving a picket of 40 dragoons in front of the 3 Portuguese cavalry regiments under Major-General D'Urban.

most certainly turn our right flank, I hope the guns there will be able to get away.'

By this time the French cavalry had gained much upon us and the cowardly scoundrels of Portuguese put about and set off as hard as they could go, leaving only 20 of the German cavalry to protect us. We of course limbered up and away we went at speed; by the time we had galloped 300 or 400 yards the confusion became very great, the Portuguese had given way in every direction and were flying before the enemy who were close upon our heels. At this time I was galloping about a dozen yards in rear of the last gun, and had continued about a quarter of a mile further, when, whether my horse made a trip, or whether one of the cowardly scoundrels in crossing me upset him, I know not, but certain it is that we came head over heels together, and away he went leaving me upon the ground. I was hurt a little by the fall and had one of my shoes nearly torn off my foot. How I escaped being ridden over I know not for the dust was so great it was impossible to see a yard before one, however, as soon as I got upon my feet and had run about 50 yards, I found the enemy had got in upon one of our right guns, and I saw them cut the drivers from their horses. I thought I had no business there and so ran on and came upon the second right gun which the French had been at; the three drivers were lying dead by their horses' side. I then ran away to the right, when I discovered the gun I had left was not in the hands of the enemy but had been upset, and our poor fellows, my friend Bombardier Morgan at their head, had dismounted to right it. I returned towards them, but before I had gone many yards, I heard a terrible shriek of '*Avanti, Avanti, ah traditor inglese,*' I looked behind me and discovered about 4 squadrons not more than 50 yards in my rear. The officer commanding them rode and made a cut at me but I made my bow and escaped. As soon as he could pull up his horse he came at me again. When I saw this I sang out '*Ufficiale inglese prigioniere,*' he then came up brandishing his sword over my head saying '*Mi dia la sua spada, Mia dia la sua spada,*' all I had to say on this subject was '*si, si si.*'

A staff officer then rode up and asked me what country I came from? 'England,' says I, 'Signor,' which seemed to please him mightily, and he took me off to a General officer who was near at the time, who addressed me in English, at least it was nearer our language than any other. He asked me what cavalry we had in the field, I said 8000, he told me I told a lie and desired I would speak the truth. I said Lord Wellington had that number with him, but that perhaps he had not at the moment more than 3000 in the field, (though I knew his Lordship had not more than the latter number altogether with this part of the army). The General then rode away shaking his fingers at me and saying I was a bad one.

I was then given in charge to one of his orderlies to be marched to the rear. He had not taken me above a hundred yards before he desired me to give up my spurs, a very favourite pair Bertie Cator gave me many years ago at Malta, by the time I had got them off, up came all the poor fellows belonging to our guns, some of them most dreadfully mangled. Though we were all sorry to find ourselves in such a situation, yet we were naturally happy to be together. At this moment a General rode across near me, and I called to him to allow his surgeon to dress my wounded, which he instantly consented to do and I got them bound up as comfortably as I could expect; one poor fellow, a corporal, had nine wounds. I had him dressed first and laid aside, and was attending to another, when the corporal called to me to say he was dying and that a Frenchman was stripping him, I looked round and there the fellow was pulling his boots off; he paid no attention to what I said, and I suppose if I had said much more he would soon have had mine off.

The next morning, the 12th, at daylight I got up and looked out of the window. I saw the gun horses going past with the French scoundrels on their backs. From a French officer I learnt with no small delight that they had burnt the three guns they had taken from us, for I knew we should soon be able to replace the carriages.

About an hour after this I was sent for with all the prisoners to the general's house. He selected all those very badly wounded, about 5, and put them into a house that the English might fetch them away when the French retired. Those with only one cut or stab they obliged to march on without once having had their wounds dressed, but when I left them they were all getting quite well. Just as we were marching off, who should I see brought into the ring but my friend the German Colonel; he had been taken poor fellow, after having made three or four most desperate charges. Oh how the poor fellows of his regiment who were left behind to protect us behaved! There were certainly not more than 20 of the Germans, but the instant they saw the scrape the guns were in they formed up in support, which was no sooner done than down came at least 150 cavalry and lancers, and though they fought like men were soon overpowered and every soul of them cut to pieces."¹

Apropos of this affair we have a good story. Captain Dyneley in after years used to say that his last recollection before being upset was as follows.

"Lieutenant Swabey being temporarily absent, Lieutenant Robe was doing duty in his place. The latter had a sword which

¹ Lord Wellington in his despatch from Madrid, August 13th, says, "The conduct of the brave German cavalry was, I understand, excellent, as well as that of Captain Macdonald's troop of Horse Artillery."

The casualties were, killed 53, wounded 98, missing 44.

had attracted some notice from an inscription of which he appeared to be somewhat shy, and which ran to the effect that the weapon was 'the gift of his affectionate father in approbation of his good conduct.' This was a standing joke. Whilst the officers were engaged in the rear trying to check the Portuguese flight which not only left them exposed but prevented their retiring, Lieutenant Newland perceiving the French close on them, while he drew his own sword, shouted to Robe, 'Now then Robe,' out with your approbation."

The services of Lieutenant Wm. Livingstone Robe, R.H.A., (Kane's List No. 1390), son of Colonel Sir William Robe, K.C.B., R.A., were so numerous and he was so distinguished a young officer that it is not out of place here to give them in some detail. He obtained his first commission October 3rd, 1807, and went that year under Sir John Moore to Gottenburg. In August 1808 under the same officer he went to Portugal, and in October advanced with his army to Salamanca and Astorya, and was present in the retreat from thence to Coruña. Engaged at Lugo.

From Gibraltar he joined Lord Wellington's army on March 11th, 1811, at Pombal while engaged with the French then in retreat, and he was in all the daily actions of that pursuit of Masséna, particularly at Sabugal, April 3rd, at Fuentes de Honor, May 3rd, 4th, and 5th. He served at the 1st siege of Badajoz, June 1st to 10th, and at the repulse of Marshal Marmont's attack at El Bodén, September 25th.

At this time he was recalled to Gibraltar, but on the way he threw himself into Tarifa, and served during the siege by General Laval, December 19th, to January 4th, 1812. He was commanded for his able defence from the Island.

He afterwards joined Lord Wellington's army, and was attached to "E" troop R.H.A., served at the action on the heights of Salamanca, June 16th, 1812, at the siege of the forts June 17th, to 27th. At the operations prior to, and at the battle of Salamanca, July 22nd, on which day he was in charge of the two pieces of "E" troop from one of which a shell wounded Marshal Marmont just before the battle, this was known afterwards through the prisoners. He was engaged at Majalahonda, August 11th, against the troops of Joseph Bonaparte, at the capture of Madrid and surrender of the Retiro, August 13th and 14th. He served at the siege of Burgos, September 18th to October 18th. In the retreat from Burgos, his father being wounded near Valladolid, he attended him to Lisbon and thence to England.

In 1813, he rejoined the army on the Bidassoa. The Marquis of Wellington having given him the command of a brigade of mountain guns carried on mules, he was with them at the battles of Nivelles and Nive in November and December, when he had the honour of being mentioned and recommended for the gold medal for Nivelles and clasp for Nive, being the only subaltern officer so noticed. On the advance of the army into France he was employed at the investment of Bayonne, and was instrumental in obstructing the conveyance of supplies for that place by destroying the boats, one of which he forced to run on shore, and then burnt by hot shot from his small guns.

On the reassembling of the army under the Duke of Wellington in Belgium in 1815, he joined it with Captain Norman Ramsay's "H" troop R.H.A. He was engaged in the retreat from Quatre Bras on the 17th June, and in the memorable battle of Waterloo concluded his short but active career in his countries service, being shot at the close of the day by a rifleman while directing his guns against the enemy's columns.

Some particulars of his death and of his character are given in the following letters. Writing to Sir William Robe from Amiens 7th August 1815, 2nd Captain and brevet Major A. Macdonald says, "I should have written you long ere this had not a wound which deprived me of the use of my arm prevented me. As to the fall of your lamented son and my esteemed friend, I can only say that few young men have left this life more sincerely regretted, and his exertions on the 18th will ever endear his memory to all who witnessed his noble conduct on that day. Major Ramsay's last words to me were as follows, 'did you ever witness such conduct as that of Brereton and Robe?' About 5 o'clock on the 18th your son received a mortal wound, and about the same time the following day he died at the village of Waterloo, after twice having taken leave of me in the most friendly and affectionate manner. His remains were interred in a beautiful spot in the village of Waterloo, where I intend to raise a monument to his memory."

Writing to his father on the 8th July 1815 from Paris, Lieutenant Robe, R.E., says, "Major Macdonald, and the surgeon that formerly belonged to Bean's troop at Chatham, I forget his name, [Ambrose] were with him when he expired, both of whom were his particular friends. The former was with him when he received his wound, he says he called to him immediately for assistance and thought he could walk off the field, but on attempting to rise from the ground he found he was unable. Macdonald then ordered some men to carry him to a house in Waterloo, and he accompanied him and saw every possible care taken of him. Upon the surgeon examining the wound he found the ball had entered his groin and settled in the intestines, which caused an inflammation which proved fatal. When the surgeon told him it was impossible to save him, he appeared quite calm, and said there was no help for it, shook hand with him and Macdonald, and did not seem the least to regret his fate. When they asked him if he had anything to say to his friends, he said, 'No, only give my love to my father and mother, and all my friends at home and

To return to the diary and "D" troop.

24th August.—Rode in the evening to Villa Franca and called on General Long; whilst there Stenowitz, Sir William Erskine's aide-de-camp, who was taken whilst reconnoitring a few days ago, was sent in by the count d'Erlon, even without being exchanged. This handsome conduct excites universal applause which is the due of our courteous and liberal enemy. Instead of expecting to have him restored everyone believed he would be hung as a deserter from the French, for, having been taken from the Austrians in the battle of Wagram, he had entered their service, but on their entering Spain had deserted and enlisted in our 1st Hussars, where his story and his merit soon brought him a commission. His exploits since are well known; certainly with all justice he might have been hung.

25th August.—I was fortunate enough to find in my landlord's house an old edition of Don Quixote and commenced reading, but found the early Spanish language as difficult to understand as the work of Chaucer would be to a Spaniard instructed recently in our modern English.

My priest was one of the few well-informed of this country, and had a very fair collection of books. This exception is not as generally supposed peculiar to priests, for in most of their houses I have generally in vain tried to find any other than religious books. These usually are the lives of different saints, alias a compendium of ecclesiastical impositions.

26th August.—Received an order to march at 2 o'clock in the

say to them I hope I have behaved like a soldier.' He soon after became insensible and remained so for some time, when he recovered the doctor saw it was his last moments, went up to him but found him speechless. On perceiving him, William stretched out his hand, and when he gave him his, he squeezed it and expired.

Macdonald at this time was suffering so much from his own wound that he could not see him. It is impossible to say how much we owe to these two gentlemen for their kindness and attention to him, as well as the regard we must all feel for the kind manner in which they speak of him, indeed he was beloved by all his brother officers as much for his virtues as his bravery. Macdonald says had he and poor Cromie* lived they would have been particularly mentioned, and every interest made for their promotion, that before poor Ramsay was killed, he came up to him and expressed his astonishment at their cool and gallant behaviour when the fire was so hot that it was impossible to imagine that anyone could escape. He expressed himself nearly in this manner. 'Those two fellows, Cromie and Robe, are invaluable officers, did you ever see anything to equal such behaviour.' The man who shot him was quite close, and took deliberate aim at him, indeed the enemy were so near that the guns were nearly surrounded, and still the men remained firm to them."

In the church at Waterloo there is a monument to Lieutenant Robe's memory with the following inscription.

Erected by his brother officers
to the memory of
Lieutenant William Livingstone Robe
of the British Royal Horse Artillery
Son of Colonel Sir William Robe
K.C.B., and K.T.S.

He fell nobly at Waterloo, 18th June, 1815,
aged 24 years

being the 33rd time he had faced his country's foes.

He was known and distinguished by
Field Marshal the Duke of Wellington.

From Record of Service and letters in possession of the late Miss Vimiera Robe.

* Lieutenant Cromie was in "D" Troop, and died from the loss of both legs; both troops were on the right of the Charleroi road and contiguous to one another.

morning to Villa Franca where we remained and bivouacked. I went and hid my diminished head in the town not thinking it a match for the rays of the sun.

27th August.—Marched at 2 o'clock to Usagre where we bivouacked in the old place near Bienvenida.

28th August.—Marched into quarters at Villa Garcia for the day. For the first time since my illness I did the whole of the duty.

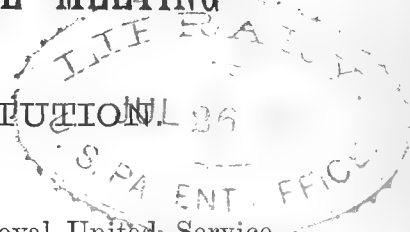
29th August.—Marched at 3 o'clock for Berlanga where we got into houses. The Spaniards have quite changed their tone in all their towns since we were here before. They have suffered the next extreme to total ruin. The French have robbed them of all their property, carts, mules etc., corn and everything they had time to take away.

Speaking of the character of these practical oppressions I cannot omit a circumstance which sets them out in all their bloody colours. At Villa Garcia whilst sitting in my house after dark one of the men brought a Spaniard to me declaring he had stolen his jacket, I was conversing with a priest who seemed quite lost in surprise because as he expressed it, the man did not tremble before me, saying, if I had been a French officer he would have been shaking from head to foot and most likely would have been hung. When I found no direct proof against the man I ordered him to be liberated which still more astonished the divine who upon enquiry I found out to be a member of the *Santa Hermandad*¹ or inquisition.

¹ "Holy Brotherhood," associations of cities of Castile and Aragon to defend their liberties, began about the middle of the 13th century. The brotherhood was disorganised in 1498, order having been firmly established. It is said to have been continued as a voluntary "police." Haydn Dictionary of Dates.

(To be Continued).

ABSTRACT OF THE PROCEEDINGS
OF THE
FIFTY-EIGHTH ANNUAL GENERAL MEETING
OF THE
ROYAL ARTILLERY INSTITUTION



THE Meeting was held in the Lecture Theatre, Royal United Service Institution, Whitehall, at 3 p.m., Friday, 7th June, 1895.

Lieut.-General E. F. Chapman, C.B., Director of Military Intelligence, took the Chair at 3 p.m., and asked the Secretary to read the Report as follows :—

The number of Members joining is one more than in the preceding year. Annual Report

The Library continues to increase, and soon the Committee will have to face the question of further extension.

During the Winter Season there were nine Lectures, and the attendance at all of these was excellent. This season, as last, the Committee have twice been 'At Home,' at 4 p.m., and on each occasion the reception was succeeded by a Lecture; that in November given by Professor C. V. Boys, F.R.S., on "Quartz Fibres," and that in March by Doctor Bowdler Sharpe, F.R.S., LL.D., on "Curiosities of Bird Life;" each was thoroughly appreciated by a crowded audience. The latter Lecture has drawn attention to the fine Ornithological Collections and Library belonging to the Institution. The Lecture by Major E. S. May, R.A., on the 7th March, on the "Co-operation of Guns with Cavalry," secured a large attendance; the Lecture and discussion have been published in a recent number of the 'Proceedings,' and the Committee think it should prove interesting to each service. Lectures.

The other Lecturers were Major A. J. Hughes, R.A., on "Okehampton, 1894;" Lt.-Col. J. R. J. Jocelyn, R.A., on "Coast Artillery in Action;" T. M. Maguire, Esq., LL.D., on "General Bourbaki's Campaign;" Major P. A. MacMahon, F.R.S., R.A., on "Terrestrial Refraction and Mirage;" Victor Horsley, Esq., F.R.S., on "Bullet Wounds of High Velocity Small Bore Rifles;" Captain M. Horace Hayes, F.R.C.V.S., on "The Horse from a Military Point of View."

Among the Gifts received, the most valuable is the Collection of Dickson Manuscripts, notes and papers; these consist of diaries, note books, commentaries, and correspondence of the late Major-General Sir Alexander Dickson, G.C.B., K.C.H., R.A., and of his son General Sir Collingwood Dickson, G.C., G.C.B., R.A., by whom they were presented to the Institution. They are contained in four large chests which are deposited in the Instrument Room, and the Committee have authorised Gifts.

the Secretary to undertake a descriptive catalogue of the entire collection. When this is completed it will be easier to judge how the information can be best used for the benefit of the Regiment and to the honour of the Dickson family.

Honorary
Members.

The Committee have elected the following gentlemen connected with military arts and sciences Honorary Members, viz. :—

J. C. Ropes, Esq., Author of "Life of Napoleon," "Waterloo,"
"The Story of the Civil War in America," &c.
Victor Horsley, Esq., F.R.S., M.B.

A Sub-committee was appointed last July to consider the question of re-publishing Kane's List, and how the valuable information collected by General W. H. Askwith, Col. Commandant, might be used to the greatest advantage. They received a small grant of money from the Committee and now report that General Askwith's notes have all been copied out into a form most convenient for reproduction; these notes when added to Kane's List as now printed will considerably increase its bulk, and will give the foreign and war services of every officer who has served in the Regiment. The Committee are still engaged in completing the MSS. of the revised Kane's List, and they recommend that when ready, it shall be sent to a printer for an estimate of the sum required to print and publish the work.

Publications

During the year grants were made to two officers formerly in the Regiment, to assist them in the production of works of regimental historical interest; and the Committee are glad to be able to announce that they are about to publish Col. N. L. Walford's translation of Von Hoenig's valuable work, "24 Hours of Moltke's Strategy," a graphically detailed story of the battle of Gravelotte and St. Privat. This work is issued gratis to every Member of the Institution, much in the same form as Col. Walford's translations of Prince Kraft's letters.

Rotunda
Museum

Thanks to the kind help of Capt. C. Orde-Browne, the Committee have been able to make a very characteristic display in the Rotunda Museum of the men in armour, among others the suit of armour, generally believed to have been Bayard's, has been fitted on a model and mounted on a horse in a central position.

H.R.H. the Colonel of the Regiment has been pleased to allow of the inscription on the Rotunda Pillar, among 'the names memorable in the service of the Artillery,' of that of Lieutenant-General Sir John Macleod, G.C.H., the first D.A.G., R.A., and afterwards Director-General of Artillery.

The Committee, with the sanction of the Trustees of the Lefroy Gold Medal Trust, have adopted as the Seal of the Institution, a device of Britannia seated studying a chart with a heavy B.L. gun on iron carriage close behind her, and the sea with cliffs rising from it in the background, bearing on it the motto 'Arte et Marte,' and have provided for the use of Members a design of the Regimental Arms, mottos and device correctly painted for them by the Herald's College.

Among the deaths are to be noted the names of the following Officers :—

Gen. R. F. Copland-Crawford, Col. Commdt.; Gen. Sir D. E. Wood, G.C.B., Col. Commdt.; Lt.-Gen. H. P. Goodenough; Major-Gen. J. H. P. Anderson; Major-Gen. R. Curtis; Major-Gen. F. G. Ravenhill;

Major-Gen. W. L. Yonge ; Col. Sir G. A. Maude, K.C.B. ; Col. G. C. H. Parlbv ; Lt.-Col. S. G. Fairtlough ; Surg. Col. A. C. Gaye ; Lieut. C. Kenny.

Accounts—

Appendices A and B show the previous year's charges before each item.

The General Credit is £4256, as against £4096 last year.

The Accounts, as submitted, were passed by the meeting.

The subject of the essays for the Duncan Gold Medal, 1895, was "The most suitable system applicable for training together in peace time the Garrison Artillery forces of the Empire, including Regular, Militia, Volunteer, and Colonial Artillery, with a view to their duties in war time in Coast Fortresses being more clearly defined."

"Duncan"
Gold Medal
1895.

Major-Gen. H. LeG. Geary, C.B., Col. R. McG. Stewart, C.B., A.D.C., and Col. H. H. Goodeve, A.A.G., kindly consented to act as Judges.

Thirteen Essays were submitted for competition, and the Judges recommend that the writer of the essay bearing the motto "In medio tutissimus ibis" be awarded a Silver Medal; that the writers of the essays bearing the mottos "Pro aris et focis" and "Mens sana in corpore sano" be commended.

The Secretary opened the sealed envelopes and announced that Captain E. G. Nicolls, R.A., is the winner of the Silver Medal, and that Lt.-Cols. R. F. Williams, R.A., and A. W. White, R.A., are commended.

Rewards for Papers—Col. G. J. Burgmann, Lt.-Col. R. A. Montgomery, R.A., and Capt. J. M. Grierson, R.A., kindly consented to act as Judges.

Rewards for
Papers.

The sum of £50 is awarded in proportions as below for the papers as follows—

Colonel F. A. Whinyates ...	...	"Swabey's Diary" ...	£6
Major R. H. Murdoch, R.A. ...	...	"Brome-Walton Family" ...	£6
Major Sir G. S. Clarke, K.C.M.G., R.E. ...	...	} "Floating Defence" ...	£5
Major F. G. Stone, R.A. ...	...	
Major H. P. Hickman, R.A. ...	...	"Artillery Mobilisation" ...	£4
Major R. M. Kelly, R.A. ...	...	"Attack of Land Fortress" ...	£4
Captain C. E. Calwell, R.A. ...	...	"Coast Defence Fire" ...	£3
Major E. A. Lambart, R.A. ...	...	"Some Sites of Battle" ...	£3
Major-General F. W. Stubbs ...	...	{ "Several translations from Russian" ...	£3
Major J. Hotham, R.H.A. ...	...	
Major J. Manifold, R.A. ...	...	"Stubbs's Diary" ...	£2
Major A. J. Hughes, R.A....	...	"Care of Troop Horse" ...	£2
Major H. C. C. D. Simpson, R.A....	...	"German Manœuvres" ...	£2
Captain S. P. Oliver ...	...	"Okehampton Experiences" ...	£2
Lieutenant-General T. Nicholl ..	...	{ "Mountain Artillery Estab- lishments" ...	£2
Captain C. P. Martel, R.A. ...	...	
	...	"Centenary Ecole Poly." ...	£2
	...	"Saugor" ...	£2
	...	{ "Better training of Volunteer Artillery" ...	£2
	...		

Lt.-Col. J. C. Dalton, R.A., moved : "That the thanks of this meeting be given to the Judges of Prize Essays and Judges of Rewards for kindly undertaking these tasks." He said, "I think that anybody who knows the work involved in adjudicating upon Thirteen Prize Essays of a technical character, and upon the many and varied subjects discussed in a year's 'Proceedings,' will agree with me that the Judges are deserving of our best thanks." Lt.-Col. J. K. Trotter, R.A. seconded the motion, which was carried unanimously.

COMMITTEE.

Changes during the past year.

Lt.-Col. E. Blaksley	Vice Col. C. H. Spragge
Lieut. L. R. Kenyon	„ Capt. J. M. Grierson

It is now constituted as follows :

PATRON AND PRESIDENT.

Field Marshal H.R.H. The DUKE OF CAMBRIDGE, K.G.

VICE-PRESIDENTS.

The Director of Artillery.

The Deputy-Adjutant-General, R.A.

The General Officer Commanding Woolwich District.

MEMBERS.

The Assistant-Adjutant-General, R.A.

The Director, Artillery College.

The Assistant-Adjutant-General, Woolwich.

The Secretary, Ordnance Committee.

Col. G. J. Burgmann	Major H. C. Selater
„ R. D. E. Lockhart	„ E. S. May
Lt.-Col. J. C. Dalton	Capt. H. J. DuCane
„ E. M. Baker	„ A. Crawford
„ E. T. Browell	„ G. R. Darley
„ E. Blaksley	Lieut. A. S. Buckle
Major C. F. Hadden	„ L. R. Kenyon
„ A. C. Hansard	

Bankers.

Messrs. Cox & Co., and London & County Bank.

Solicitor.

E. W. Sampson, Esq., Woolwich.

TRUSTEES.

General Sir C. Dickson, *Q.C.*, G.C.B.

„ Sir H. A. Smyth, K.C.M.G.

Lieut.-General R. P. Radcliffe.

Secretary—Major A. J. Abdy.

The Report was adopted, and the constitution of the Committee was confirmed.

Two subjects were then chosen for submission to H.R.H. the Commander-in-Chief, the one selected by him will be announced as that for the Duncan Gold Medal Prize Essay, 1896.

After a few remarks, the Meeting proceeded to the consideration of the R.A. Charities.

ACCOUNTS OF

1893-94.	EXPENDITURE.
<i>£</i> 127	Wages—Compositors, &c.
63	Printing Accounts, Including Grants in Publications
114	Printing, etc. { Folding, Stitching, &c.... ..
217	Printing Materials
165	Wood Engraving and Lithography
688	
40	Classes... ..
11	Lectures
452	Library and Books for Sale
41	Museum
11	Observatory
23	Carpentry and Repairs { Wages
46	Materials
70	
10	Stationery... ..
74	Postage and Parcels
138	Clerks and Orderlies { Wages
13	Clothing
151	
4	Auditors
5	Subscriptions to Societies
31	Fire Insurance
26	Washing and Cleaning
9	Subscriptions refunded
4	Collecting Woolwich Bills and Xmas Boxes
78	Medals, Honoraria and Rewards
17	Arrears of Subscriptions written off
Grant {	Repair of
5 {	Crimean Graves
1736	
292	Balance—Being Surplus of Income for the year ending 31
2028	

1894.	DR.	LIABILITIES, &c.
<i>£</i>		
228	To Sundry Creditors, viz.:	{ Accounts for Goods, Printing, by the Institution, and in Expenditure for the year 18
8		Amount to Credit of Members o
15		Accounts
Rotda. }		
Reprs. }		
262		
16	To Members' Subscriptions paid in advance	...
	To Balance, being Surplus of Assets in this Balance Sheet March, 1895, viz.:	
3804	Surplus at 31st March, 1894	...
292	Add.—Surplus of Income for the Year ending 31st March as per Expenditure and Income Account	...
4096		
	N.B.—This Surplus is in addition to the value of the Museum and Library, Instruments, Furniture, &c. belonging to the Institution, which the Committee have at £11,000, and which are insured for that sum in the Sun	
4375		

We have compared the foregoing Balance Sheet, of the 31st March, with the Books of the Institution, and we Certify that the Cash and Ledger Accounts, with the Daily Cash Book, tally with the same, and that the Bank of England has received from the Bank of England.

LONDON, 13th May, 1895.

APPENDIX A.

GENERAL ABSTRACT

OF THE

ACCOUNTS OF THE ROYAL ARTILLERY INSTITUTION,

For the year ending, 31st March, 1895.

EXPENDITURE.				INCOME.			
1893-94.		£ s. d.	£ s. d.	1893-94.		£ s. d.	£ s. d.
127	Wages—Compositors, &c. ...	137 19 5		113	Printing ...	61 11 4	
63	Printing Accounts, including Grants in aid of Publications ...	128 1 8		261	Books, &c. ...	205 7 10	
114	Folding, Stitching, &c. ...	139 1 4		26	Postage and Parcels ...	22 12 2	
217	Printing Materials ...	259 18 8		4	Carpentry ...	3 8 6	
165	Wood Engraving and Lithography ...	144 1 8		407			292 19 10
688			809 2 9	76	Entrance Fees—		
40	Classes... ..		35 17 8		Received ...	79 0 0	79 0 0
11	Lectures		52 0 1	1409	Entrance Fees and Subscriptions for 1894-95.		
452	Library and Books for Sale		310 1 11	37	Subscriptions—		
41	Museum		34 4 0		Received ...	1430 1 0	
11	Observatory		10 1 2		Outstanding ...	31 1 6	
23	Carpentry and Repairs { Wages	23 13 0		1447	Dividends on Consols at 2½ per cent. less Income Tax, viz.:—		1461 2 6
46	Materials	34 12 0		86	{ For ½ of a year on £3240 13 11 }		96 3 8
70			58 5 0	11	{ For ½ of a year on £3739 1 9 }		2 0 11
10	Stationery... ..		10 1 3		Interest on Bank Deposit Account ...		
74	Postage and Parcels		68 18 0				
138	Clerks and Orderlies { Wages	153 1 6					
13	Clothing	8 16 9					
151			161 17 6				
4	Auditors		4 4 0				
5	Subscriptions to Societies		5 5 0				
31	Fire Insurance		31 18 6				
26	Washing and Cleaning		25 17 1				
9	Subscriptions refunded		16 6 0				
4	Collecting Woolwich Bills and Xmas Boxes		4 7 6				
78	Medals, Honoraria and Rewards		118 13 6				
17	Arrears of Subscriptions written off		4 17 0				
Grant {	Repair of						
5 {	Crimean Graves						
1736			1791 17 11				
292	Balance—Being Surplus of Income for the year ending 31st March, 1895 ...		139 9 0				
2028			£1931 6 11	2028			£1931 6 11

APPENDIX B.

BALANCE SHEET—31st March, 1895.

1894.	DR.	LIABILITIES, &C.	£ s. d.	£ s. d.	1894.	ASSETS.	£ s. d.	CR.	£ s. d.
238	To Sundry Creditors, viz.: ...	Accounts for Goods, Printing, &c., owing by the Institution, and included in Expenditure for the year 1894-95 ...	138 9 5		927	By Cash in hand, and at Bankers, including £300 on Deposit Account at Interest ...			483 19 7
8	Rotda. Reprs. }	Amount to Credit of Members on Current Accounts ...	11 5 0		140	By Sundry Debtors, viz.: ...			
15					63	Amount owing by Members on Current Accounts, included in Income ...	110 13 1		
262				149 14 5		Amount owing by Members for Subscriptions, included in Income ...	57 1 0		
16	To Members' Subscriptions paid in advance ...			24 2 0	203	By Stocks on hand, viz.: ...			167 14 1
	To Balance, being Surplus of Assets in this Balance Sheet, at 31st March, 1895, viz.: ...			173 16 5	19	Printing Paper ...	31 6 9		
3804	Surplus at 31st March, 1894 ...		4096 15 4		32	Books for Sale ...	34 12 2		
292	Add.—Surplus of Income for the Year ending 31st March, 1895, as per Expenditure and Income Account ...		139 9 0		51				65 18 11
4096				4236 4 4	3192	By Investment, viz.:—£3739 1s. 9d. Consols at ...			3692 8 2
	N.B.—This Surplus is in addition to the value of the contents of the Museum and Library, Instruments, Furniture, Fixtures, &c., belonging to the Institution, which the Committee have estimated at £11,000, and which are insured for that sum in the Sun Fire Office					Including £498 7s. 6d. Consols purchased in May, 1894, at a cost of £500.			
4375				£4410 0 9	4375				£4410 0 9

AUDITORS' CERTIFICATE.

We have compared the foregoing Balance Sheet, of the 31st March, 1895, and the Expenditure and Income Account for the year ending at that date, with the Monthly Cash Accounts, audited by the Committee, and with the Books of the Institution, and we Certify the same to be correct statements of the affairs of the Institution, as recorded in the said Books and Accounts. We have tested portions of the Cash and Ledger Accounts, with the Daily Cash Book, the Bank Pass Books, and the Vouchers, and have found them in order. We have verified the Investment in Consols, with the Certificate received from the Bank of England.

LONDON, 13th May, 1895.

AGAR, BATES & Co., Chartered Accountants.

APPENDIX C.

Increase and Decrease of Members 1894-95.

RANKS.	1st April, 1894.	Increase.			Total Increase.	Decrease.				Total Decrease.	Balance.		31st March, 1895.
		Promotion.	Retirement.	New Members.		Promotion.	Retirement.	Withdrawals.	Deaths.		Decrease.	Increase.	
EFFECTIVE LIST.													
General and Field Officers ...	455	15	—	—	15	—	35	—	4	39	24	—	431
Captains	445	18	—	2	20	15	3	3	—	21	1	—	444
Lieutenants ..	603	—	—	75	75	18	6	—	4	28	—	47	650
Medical Officers	1	—	—	—	—	—	—	—	1	1	1	—	—
Vet. Surgeons ...	1	—	—	—	—	—	—	—	—	—	—	—	1
Quarter-Masters	1	—	—	—	—	—	—	—	—	—	—	—	1
RETIRED LIST.													
General and Field Officers... ..	182	—	28	—	28	—	—	17	10	27	—	1	183
Captains	76	—	2	—	2	—	—	—	—	—	—	2	78
Lieutenants ...	19	—	1	—	1	—	—	1	—	1	—	—	19
Paymasters ..	2	—	—	—	—	—	—	—	—	—	—	—	2
Riding Masters ...	1	—	—	—	—	—	—	—	—	—	—	—	1
Medical Officers ..	2	—	—	—	—	—	—	—	—	—	—	—	2
Chaplains ...	1	—	—	—	—	—	—	—	—	—	—	—	1
<i>Honorary Members</i>	33	—	—	1	1	—	—	2	—	2	1	—	32
Totals... ..	1822	33	31	78	142	33	44	23	19	119	27	50	1845

APPENDIX D.

Presentations to the Library.

Lithographs	R.L., Nos. 218 to 222 R.G.F., Nos. 151 to 155 R.C.D., Nos. 184a, 206, 208, 211, 212, 214 & 215	Secretary of State for War.
(Coloured)		
Report of the Committee appointed to enquire into the Entrance Examinations (in non-military subjects), of Candidates for Commissions in the Army, 1894		

Eighteenth Annual Report of H.M. Inspectors of Explosives, 1893	} Secretary of State for War.
Instructions for Horse, Field and Mountain Artillery Practice, 1894... ..	
Musketry Instruction, M.H. Rifle and Carbine, and M.M. Carbine, 1894	} Deputy Adjutant General, Royal Artillery.
Regulations for Army Medical Services, 1894	
Pay Warrant, 1894	
Manual of Military Engineering, 1893	
Manual of Saddles and Sorebacks, 1894	
Dress Regulations for the Army, 1894	
Regulations for Magazines, Ammunition Stores, Laboratories, &c., 1894... ..	
Regulations respecting the Senior Class of the Artillery College, 1894	
Handbook for the R.M.L. 17.72" 100 ton gun, Land Service, 1894	
Rules for the Conduct of Field Manœuvres	
Handbook of the Military Forces of Russia, 1894	
Annual Report of the Army Veterinary Department, for the year ending, 31st March, 1894	
Extracts from the Annual Report of the President, Ordnance Committee, 1893	
Regulations for a Course of Instruction in Submarine Mining, at all Stations, except the School of Military Engineering	
Regulations for the Supply of Clothing and necessaries to the Regular Forces, 1894	
Report upon the Fourteenth Senior Class at the Artillery College	
Manual of Military Law, 1894... ..	
Queen's Regulations, 1894	
Handbook for the 16 inch R.M.L. Gun, 1894	
Regulations for the Army Veterinary Department, 1894	
Regulations for Mobilization, Home Defence, Regular Forces, 1894, 2 copies	
Regulations for the Volunteer Force, 1894	
Allowance Regulations, 1894	
Regulations for Military Savings Bank and Regimental Charitable Funds, 1894	
Approved arrangements for Siege Practice at Lydd, 1895	
Arrangements for the Supply of Ammunition Targets, &c., for the Practice of Royal Horse and Field Artillery in Great Britain, for 1895	

Instructions for Siege Artillery Practice, 1895	...	...	...	...
Annual Report of the School of Gunnery, Horse and Field Artillery Practice at Home, 1894	...	...	...	...
Annual Report of the School of Gunnery, 1894, Part I. Coast, Part II. Siege	...	...	...	...
Annual Report on the Instruction carried on at the School of Musketry, Hythe, during the year ending 31st, March, 1893	...	...	...	...
Manual of Military Cooking, Prepared at the School of Cookery, 1895	...	...	...	...
Instructions for Practice, Horse, Field, and Mountain Artillery, 1895	...	...	...	...
Text Book for Military Small Arms and Ammunition, 1894, 2 copies...	...	...	...	...
Regulations for the Militia, 1895	...	...	...	...
Recruitment of Officers of the Active Army in Germany, 1894	...	...	...	...
Accessions to the War Office Library, No. 10.	...	...	...	...
Sketch Map of Korea, Intell. Div. W.O., No. 935, 1st, 2nd, and 4th editions	...	...	...	...
Map of countries adjoining Korea, Intell. Div. W.O., No. 1045, 1st & 2nd editions	...	...	...	...
Handbook of the Military Forces of Russia, 1894	...	...	...	...
A description of the Method of Executing Rapid or Reconnaissance Triangulation, by Major Hon. M. G. Talbot, R.E.	...	...	...	...
Suggestions as to the best Method of teaching Small Scale Topography, by Major Hon. M. G. Talbot, R.E.	...	...	...	...
Map of Part of British and German East Africa, including the British Protectorate of Uganda. Intell: Div. W.O., No. 1012	...	...	...	...
Map of the Country Round Suakin. Intell: Div. W.O., No. 1052...	...	...	...	...
Map of the Nile Valley, between Wadi Halfa and Ambugol. Intell: Div. W.O., No. 1067	...	...	...	...
Report on Horse Breeding in Hungary, 1894	...	...	...	...
Map of Uganda and Adjoining Territories. Intell. Div., W.O., No. 1075	...	...	...	...
Particulars of Rifled Guns and Howitzers, 6 copies	...	...	...	...
Report of the Small Arms Penetration Committee, 1893 and 1894	...	...	...	...
Report upon the 14th Senior Class at the Artillery College. 2 copies	...	...	...	...

Deputy Adjutant General,
Royal Artillery.

Director of Military
Intelligence.

Director of Artillery

Dir. General of Military
Education.

The Internal Work of the Wind, by S. P. Langley	The Council, Smithsonian Institution.
Annual Report of the Smithsonian Institution, 1891, 1892 and 1893	
Tenth Annual Report of the Bureau of Ethnology	
The Pamunkey Indians of Virginia, by J. G. Pollard	
Bibliography of the Wakashan Languages, by J. C. Pilling	
The Maya Year, by Cyrus Thomas	The Council, Institution of Civil Engineers.
Proceedings of the Institution of Civil Engineers. Vols. 116, 117, 118 and 119	
Record of Transactions of the Junior Engineering Society. Vol. 3	The Council, Jr. Eng. Society
Journal of the Iron and Steel Institute. Nos. I. and II. 1894	
Notes on the Construction of Ordnance. No. 64	The Council, Iron and Steel Institute.
Annual Report of the Chief of Ordnance, U.S. Ord. Dept., 1893	
Life-sized Portrait of General Lord Roberts, <i>Q.C.</i> , G.C.B., &c., in Massive Frame	The Chief of Ordnance, U.S. Ordnance Department.
Regimental Orders of the Bengal Artillery, from August, 1827, to December, 1846	
A Collection of (37) Indian Ordnance Survey Maps	Count Ostrorog (late) R.A.
Examination Papers, R.M. Academy, February and August, 1894	
Report of the Astronomer Royal, 1894	Maj.-General F. W. Stubbs (late) R.A.
Results of the Magnetical and Meteorological Observations, made at the Royal Observatory, Greenwich, in the year 1891	
Netherlands Artillery Atlas, Plates Nos. 210 to 221, 88 to 100 and 222 to 227	Governor R.M. Academy
Report of the Meteorological Service of the Dominion of Canada for 1889	
The Bombardier and Pocket Gunner, by Captain R. W. Adye, R.A., 6th edition, d. 1809	The Astronomer Royal
Field Exercises and Evolutions of the Army, <i>d.</i> 1833	
Standing Orders and Regulations for the Royal Regiment of Artillery at Home and Abroad, <i>d.</i> 1828	Netherlands Government
Addenda to the General Regulations and Orders for the Army, <i>d.</i> 1840	
Regulations for the Provision of Clothing, etc., for the Royal Regiment of Artillery and Corps of Royal Sappers and Miners, <i>d.</i> 1824	Canadian Meteorological Office
	H. G. Slade, Esq.

Interior Ballistics, by Lt. J. H. Glennon, U.S. Navy...	Lieut. J. H. Glennon
History of the 1st Battalion Argyll and Sutherland Highlands, 91st Foot, by Lt.-Col. J. P. Groves	Lieut.-Col. J. P. Groves
History of the 21st Royal Scots Fusiliers, by Lt.-Col. J. P. Groves	
Photograph of the late Commissary General S. Tibbs	Captain W. J. Tibbs
Journal de Bord du Bailli de Suffren dans L'Indie, 1781-84, par Henri Moris	M. Henri Moris
Map of Scene of Operations of the Italian Alpine Manœuvres, 1894	Major H. C. C. D. Simpson, R.A.
Regulations Respecting the Senior Class at the Artillery College, 1894	Director Artillery College
Map of "Les Grandes Manœuvres, 1894"	Captain S. P. Oliver (late) R.A.
Water-color painting, framed in Oak, "Drowned Lands, Canada," by Lt.-Col. W. H. M. Duthie, (late) R.A.	Lt.-Col. W. H. M. Duthie (late) R.A.
Catalogue of Maps and Books in the Library of the Egyptian War Office, Compiled by Major F. R. Wingate, D.S.O., R.A.	Major F. R. Wingate, D.S.O., R.A.
Royal United Service Institution Journal, Vols. 28 to date...	Lieut.-General W. H. Goodenough, C.B.
Geographical Journal, April, 1886, to December, 1893	
Geological Journal, May, 1886, to date	
Extracts from Annual Report of the Director of Artillery, Vols. 24 & 25, Austrian Account of the Hungarian Insurrection, 1848-49	
Sundry Parliamentary Blue Books and Foreign Journals and Periodicals	Maj.-General H. LeG. Geary, C.B.
Reprint of "Preparatory General Orders issued at Newport, Isle of Wight, 4th May, 1798"	
The Story of the Civil War, a Concise account of the War in the United States of America, between 1861 and 1865, by J. C. Ropes	J. C. Ropes, Esq.
Water-color painting "Royal Artillery in Canada"	Surg. Lt.-Col. S. H. Carter, A.M.S.
The Franco - German War, 1870-71, translated from the German, by Major J. A. Ferrier, D.S.O., R.E.	Major J. A. Ferrier, D.S.O., R.E.
The Principles of Strategy, by Captain J. Bigelow, 10th U.S. Cavalry	Poultney Bigelow, Esq.
Calcul des Probabilités Appliquée au tir des Projectiles, par J. Didion, Col. D'Artillerie	Lieut.- Col. H. W. L. Hime (late), R.A.

Sur la Dispersion Naturelle des Projectiles et la Loi des Erreurs, par A. Van Muyden, Capt. D'Artillerie	}	Lieut.-Col. H. W. L. Hime (late), R.A.
Beitrag zur Schiesstheorie Angewendet auf das Schiessen mit den Schweizerischen Handfluerwaffen, von E. O. Siegfried		
Note Book, formerly the property of the late General T. A. Shore, R.A. ...	}	Mr. E. Morris
Photograph of the late Capt. Thomas Scott, R.A., great uncle of Colonel C. E. S. Scott (late) R.A. ...		
Notice Historique sur la Bataille de Waterloo	}	Col. C. E. S. Scott (late), R.A.
Plan du Champ de Bataille de Waterloo		
Partie du Plan du Champ de Bataille de Waterloo	}	The late Maj.-General W. L. Yonge, (late), R.A.
Information from Abroad — Notes on the year's Naval Progress, July, 1894		
Key Map to the Engraving, "Wreck of the Birkenhead"	}	U.S. Naval Intelligence Office
The Frontiers of the British Empire in India		
Developments of Field Artillery Fire, by Capt. P. J. R. Crampton, R.A. ...	}	Major A. D. Seton
Two photographs of German Field Artillery crossing the river Moselle on Rafts		
Distribution of H.M. Forces, at Home and on Foreign Service, 1767, formerly the property of George Morrison, Q.M.G.	}	T. M. Maguire, Esq., LL.D.
Regulations and Instructions for the Infantry Sword Exercise, <i>d.</i> 1819 ...		
Professional Papers of the Corps of Royal Engineers. Vol. 20	}	Captain P. J. R. Crampton, R.A.
Notes on Suitable Stations in Norway for viewing the Total Eclipse of the Sun, on 8th August, 1896, by Col. A. Burton-Brown (late) R.A., F.R.A.S., F.R.G.S.		
	}	Captain F. R. Maunsell, R.A.
	}	Captain J. A. Labalmondiere R.A.
	}	R.E. Institute
	}	Col. A. Burton-Brown (late), R.A.

APPENDIX E.

Books, &c., Purchased.

- Monograph of the Paradiseidæ or Birds of Paradise, and Ptilonorhynchidæ or Bower Birds. Parts 3 and 4.
- Forms of Attack, with Plans and Sketches. By Brig.-General Kinloch.
- Hakluyt Society's Publications. "Voyages of Captains Foxe and James, to the North West." 2 Vols. "Letters of Amerigo Vespucci."
- Einzeldarstellungen von Schlachten aus dem Kriege Deutschlands gegen die Französische Republik.
- Schlachten Atlas. Parts 38, 39, 42 and 43.

- English Army Lists and Commission Registers, 1661-1714. Vol. 2.
By Charles Dalton, F.R.G.S.
- Gall's Modern Tactics, 3rd edition.
- Historie de la Campaign de 1815—Waterloo. Par Lieut.-Colonel Charras. 2 Vols. and Atlas.
- The Life of John Churchill, Duke of Marlborough. By Field Marshal Vicount Wolseley, K.P., &c. 2 Vols.
- Biologia Centrali—Americana Zoology. Parts 116-120.
- Atlas of India. By Sir W. W. Hunter, K.C.S.I.
- Applications de la Fortification Passagere. Par V. Deguise.
- Korea and the Sacred White Mountain. By E. J. Cavendish and Captain H. E. F. Goold-Adams, R.A.
- The Letters and Despatches of John, First Duke of Marlborough, from 1702-1712. By General Sir G. Murray. 5 Vols.
- Prattica Manuale Dell Artiglieria, da Luigi Colliardo *d.* 1606.
- Military Essays of the Ancient Grecian, Roman, and Modern Art of War. By Sir J. Turner, *d.* 1581.
- History of the Life and Reign of Her late Majesty Queen Anne, *d.* 1740.
- Arundel Society's Publications. "The Nativity of Our Lord," after the fresco, by Pinturricchio, in the Church of St. Maria del Popolo, Rome.
- Journal d'un officier D'Artillerie, Pingot et Moi.
- Reglement sur le Service des Batteries de Montagne. Vol. 1.
- Dictionary of National Biography. Vols. 39-42.
- Hints on Driving. By Captain C. Morley Knight (late) R.A.
- Russia's March towards India, by an Indian Officer. 2 Vols.
- Dislokationskarte der Heere Europas. Parts 1, 2 and 3.
- The Gunner's Guide, or a Pocket Companion for N.C. Officers and Privates in the Artillery and Marines, *d.* 1806.
- The Franco-German War, 1870-71. Translated from the German. By Major J. A. Ferrier, R.E., D.S.O.
- Batailles Gagnées, par le Serenissime Prince F. Eugene de Savoy, sur les Ennemis de la Foi. *d.* 1725.
- The History of the Wars Occasioned by the French Revolution, including a Sketch of the early History of France, *d.* 1816.
- Transactions of the Navy Records Society, 1894. "Defeat of the Spanish Armada." 2 Vols.
- Naval and Military Magazine, 1827-1828. 4 Vols.
- History of the British Expedition to Egypt in 1803. By Lieut.-Colonel R. T. Wilson.
- Coloured prints of "Royal Artillery Repository Exercise," 1844, "Rocket Practice in the Marshes," and "Royal Horse Artillery, 1843."
- Coloured print of two figures in early Artillery Uniform.
- Chance and Luck. By R. A. Proctor.
- Periods of European History.—Period I. 476-918. By C. Oman, M.A.
- The Diary of a Cavalry Officer in the Peninsula and Waterloo Campaign, 1809-1815. By the late Lieut.-Colonel Tomkinson.
- Acts of the Privy Council of England. By J. R. Desant.
- The Life and Inventions of T. A. Edison. By W. K. L. & A. Dickson.
- Histoire des Revolutions D'Angleterre, sous le Regne de Jaques 2, Jusqu au Couronnement de Guillaume III., *d.* 1689.
- Moltke; a Biographical and Critical Study. By W. O'C. Morris.
- The Soldier's Companion or Martial Recorder.

- Our Asiatic Neighbours. By S. S. Thorburn.
 Coloured print of "Mortar Battery at Woolwich."
 Steel engraving of "The Battle of Minden."
 Forest Birds, their Haunts and Habits. By H. F. Witherby.
 Der Feldzug von 1815 in Frankreich, des Général Carl von Clausewitz.
 Two Water-color Paintings "The Camel Corps."
 Wood Carving. By C. G. Leland, F.R.L.S.
 Chromo-Litho print, "Well Earned Rest." By W. B. Wollen.
 La Défense des Cotes D'Europe, par Carl Didelot.
 Précis de l'Art de la Guerre ou Nouveau Tableau Analytique, par le Baron de Jomini.
 Uniformenkunde, Lose Blätter zur Geschichte der Entwicklung der Militarischen Tracht. Part 5.
 Kriegsgeschichtliche Einzelschriften. Parts 17 and 18.
 The Military Medley. By Thomas Simes, *d.* 1768.
 Sketches of the Character, Manners, and Present State of the Highlanders of Scotland. By Colonel David Stewart. 2 Vols.
 Carte de la Répartition et de L'Emplacement des Troupes de L'Armée Française 1895.
 Lithograph picture "Le Duc de Montpensier à L'Arsenal de Woolwich, 1846."
 The Map of Africa by Treaty. By Sir E. Hertslet, K.C.B. 2 Vols.
 The Battle of Leipzig. By Frederic Shoberl, *d.* 1814.
 A Complete History of the Campaign in the year 1708.
 Notes on the French Infantry and Memoranda on the Review of the Army in Paris in May, 1852. By Colonel A. W. Torrens.
 A Naturalist's Calendar, with Observations in Various Branches of Natural History. By the Rev. Gilbert White, M.A., *d.* 1795.
 The History of Guernsey and its Bailiwick. By F. B. Tupper.
 Grundriss der Taktik, von J. Meckel.
 Die Deutsche Reiterei in den Schlachten und Gefechten des Krieges von 1870-71, von A. D. Kunz.
 Balistique des Nouvelles Poudres, par E. Vallier.

APPENDIX F.

Presentations to the Museum.

- | | |
|--|--|
| Part of a Sledge found on the Shores of Grennell Land, Lat. 81°, 55' N. By Paymaster H. W. Feilden. ... | } J. Watts, Esq. |
| Bengal Horse Artillery Officer's Sheepskin, formerly the property of the late Col. Pasley Dirom, Bengal Horse Artillery .. | |
| A specimen of the Egg of the Great Skua, from the Shetland Islands ... | } Lieut.-Col. H. W. L. Hime
(late) R.A. |
| Two cowhide Cartouches from Sikkim ... | |
| A piece of the bark of a tree, at the foot of which two Indiana Indians were killed at the battle of Fish Creek, during the Riel Rebellion, 1885 ... | } Capt. H. de T. Phillips, R.A.

Lieut. G. G. Traherne, R.A. |

A Suit of Madhist clothing, removed from the body of a Dervish, after the battle of Suakin	}	Lieut. G. G. Traherne, R.A.
Silk Banner, with bullion tassels, Commemorative of the Naval and Military Services of the family of the late Col. P. P. Faddy, R.A., C.B., and of himself.		
A Collection of Butterflies and Beetles from India and Malta	}	Noel Hunter, Esq.
A Charm worn by Soudanese Soldiers under their uniform in action, picked up at the battle of Tel-el-Kebir ...		
A Collection of Specimens of Mineral Ores from Queensland	}	Maj.-General J. F. Owen, R.A.

APPENDIX G.

List of Papers published in the "Proceedings" during the Year.

- The French Soudan up to date—January, 1894. Compiled from the French Accounts in "Le Temps" (with permission). By Capt. S. P. Oliver, *late* R.A. (*Continued from No. 2, Vol. XXI., p. 54*). Part II.
- The Adjutancy of a Militia Artillery Unit. By an Adjutant. Communicated by the Secretary.
- The Necessity for a Firing Test to Prove Preliminary Training Complete. By Major O. S. Smyth, *D.S.O.*, R.A.
- Supply of Ammunition in the Field. By Major E. C. Hawkshaw, R.A.
- Saugor, C.P.—A Story of 1857. By Lieut.-General T. Nicholl, R.A.
- The Centenary of École Polytechnique, Celebrated in Paris on the 11th March, 1894, under the auspices of Francois Sadi Carnot, President of the Republic, and an old Cadet of the School. By Captain S. P. Oliver, *late* R.A.
- The Sanitary Care of the Soldier by his Officer. By Brigade-Surgeon Lieut.-Colonel G. J. H. Evatt, M.D., A.M.S. (*A Lecture delivered at the R.A. Institution, Woolwich, 29th January, 1894*).
- Clipping Battery Horses. By Major A. H. C. Phillpotts, R.A.
- Memoirs Historical and Biographical. The Brome-Walton Family. Chapter V. By Major and Quartermaster R. H. Murdoch, R.A., Assistant Superintendent of Records. (*Continued from No. 1, Vol. XXI., p. 39*).
- Notes on our Mountain Artillery Establishments, their Training and Personal Equipment. By Major H. C. C. D. Simpson, R.A.
- Artillery Mobilisation. By Major F. G. Stone, R.A. Chapters I., II., and III.
- The Artillery Branch of the Honourable Artillery Company of London. By Captain J. A. Labalmondiere, R.A. and Lieut. A. L. Morant, H.A.C.
- The "Outlines of Quaternions," by Lieut.-Colonel H. W. L. Hime, *late* R.A. A Review. Communicated by the Secretary.
- General Sir Charles Napier on Artillery Draught. Communicated by Captain H. A. Bethell, R.A.

- Abstract of the Proceedings of the Fifty-Seventh Annual General Meeting of the Royal Artillery Institution.
- What is the Best Tactical Organisation and System of Training Massed Batteries of Horse and Field Artillery? ("Duncan" Gold Medal Prize Essay, 1894). By Major J. L. Keir, R.A.
- What is the Best Tactical Organisation and System of Training Massed Batteries of Horse and Field Artillery? (Silver Medal Prize Essay, 1894). By Major A. M. Murray, R.A.
- What is the Best Tactical Organisation and System of Training Massed Batteries of Horse and Field Artillery? (Commended Essay, 1894). By Major E. S. May, R.A.
- The Breeding Stud of an Indian Prince. By Colonel T. B. Tyler, R.A.
- A Scheme for the Better Training of the Volunteer Artillery. By Captain C. P. Martel, R.A.
- Stable Management. By Veterinary Lieut.-Colonel W. B. Walters, C.B., F.R.C.V.S., *late* A.V.D. (*A Lecture delivered at the Royal Artillery Institution, 12th February, 1894*).
- The French Soudan. Sequel. By Captain S. P. Oliver, *late* R.A.
- The Sanitary Care of the Soldier by his Officer. A Reply. By Brigade-Surgeon Lieut.-Colonel E. Nicholson.
- Clipping Battery Horses. By Colonel T. B. Tyler, R.A.
- Attack of a Modern Land Fortress. By Major H. P. Hickman, R.A.
- Gift of Dickson Manuscripts and Notes to the R.A. Institution.
- Floating Defence. By Lieut.-Col. Sir G. S. Clarke, K.C.M.G., R.E.
- An Episode in the Life of Major-General G. H. Vesey, R.A. By Colonel T. B. Tyler, R.A.
- Saddlery, and the Causes, Prevention, and Treatment of Sore Backs. By Veterinary Lieut.-Colonel W. B. Walters, C.B., F.R.C.V.S., *late* A.V.D. (*A Lecture delivered at the R.A. Institution, 15th February, 1894*).
- Notes on the Naval Manœuvres of 1894. By Captain R. A. K. Montgomery, R.A.
- Defence of Estuaries, Harbours, etc., against Torpedo-Boat Attack. Replies. By Lieut. G. G. Traherne, Captains H. C. Williams-Wynn and H. T. Hawkins, R.A.
- Coast Defence in Relation to War. (*The first Lecture delivered at the Malta Naval and Military Society, 28th December, 1893*). By Major Sir G. S. Clarke, K.C.M.G., R.E.
- Extracts from the Diary of Lieut. F. W. Stubbs, Bengal Artillery, in 1857-58. By Major-General F. W. Stubbs, *late* R.A.
- Notes on places of Military interest in the United States. By Captain J. F. Manifold, R.A.
- Some Sites of Battle. By Captain C. E. Callwell, R.A.
- On the Revision of Kane's List of Officers Royal Artillery. By Lieut.-Colonel J. C. Dalton (h.p.), R.A.
- Brief Considerations on Coast Defence. By Major-General H. le G. Geary, C.B., R.A.
- Short Notes on the Care of the Troop Horse: for Young Officers and N.-C. Officers. By Major J. Hotham, R.H.A.
- Employment of Ground Scouts, Combat Patrols, and Orderlies of Artillery. Compiled by Major E. A. Lambart, R.A.

- Okehampton Experiences, 1894. By Major A. J. Hughes, R.A. (*A Lecture delivered at the Royal Artillery Institution, 11th October, 1894*).
- Ancient British Ordnance now in the Artillery Museum, Madrid. By Lieut.-Colonel J. C. Dalton (h.p.), R.A.
- Record Targets ; Being a short description of those now in use and a comparison of their merits. By Captain P. E. Gray, R.A.
- Diary of Lieut. W. Swabey, R.H.A., in the Peninsula. Edited by Colonel F. A. Whinyates, *late* R.H.A. Chapter I.
- A Method of calculating the Probability of Coast Defence Fire. By Major R. M. B. F. Kelly, R.A.
- A Plea for Heavy Guns in Fortress Defence. By Capt. G. Tyacke, R.A.
- Notes on German Manœuvres. By Major J. F. Manifold, R.A.
- The Story of the Civil War in America. A Review. By Major E. S. May, R.A.
- General Bourbaki's Campaign in January and February, 1871. By T. M. Maguire, Esq., LL.D. (*A Lecture delivered at the R.A. Institution, Woolwich, December 13th, 1894*).

APPENDIX H.

Precis and Translations Published during the Year.

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| FRENCH. ... | { | Electro-Metallurgy.—Aluminium. By Capitaine D'Artillerie J. Rousseau. <i>Precis</i> of a paper published in the <i>Revue D'Artillerie</i> . By F. E. B. L. <i>late</i> R.A. |
| | { | "Revue Militaire de L'Etranger." The New Firing Manual of the German Field Artillery. <i>Precis</i> by Lieut.-Colonel J. H. G. Browne, <i>late</i> R.A. |
| RUSSIAN.... | { | "Russian Artillery Journal." The resistance of the Air at High Velocities. By Captain Zabúdski, Russian Artillery. Translated by Major G. T. Kelaart, R.A. |
| | { | "Russian Artillery Journal." The Military Training of Field Artillery. Translated by Major E. A. Lambart, R.A. (<i>Continued from No. 11, Vol. XXI.</i>) |
| | { | A Russian opinion of the Chinese Army. Translated by Lieut. E. A. Campbell, R.A. |

APPENDIX I.

LIST
OF
FOREIGN MAGAZINES AND JOURNALS
TAKEN IN BY THE
R.A. INSTITUTION;

WITH THE NAMES OF OFFICERS WHO HAVE UNDERTAKEN TO SUPPLY
PRÉCIS AND REVIEWS OF THEIR CONTENTS FROM TIME TO TIME.

COUNTRY.	NAME OF JOURNAL, ETC.	TRANSLATOR.
France	Spectateur Militaire {	Major J. F. Manifold Lt.-Col. F. E. B. Loraine, <i>late</i> R.A. Lt.-Col. J. H. G. Browne, <i>late</i> R.A., and Capt. E. J. Granet.
	Journal des Sciences Militaires	
	Revue d'Artillerie {	
	Revue Militaire de l'Etranger {	
Spain ...	Memorial de Artilleria	Lt.-Col. J. C. Dalton
Germany	Neue Militärische Blätter ...	—
	Archiv für die Artillerie-und- Ingenieur-Officiere	Major R. M. B. F. Kelly.
	Militär-Wochenblatt	Major E. S. May.
Austria	Organ der Militär-Wissenschaft- lichen Vereine	—
	Militärische Zeitschrift... ..	—
	Mittheilungen, &c., des Artillerie- und Genie-Wesens	Major L. C. M. Blacker.
Italy ...	Giornali di Artigleria e Genia..	Capt. H. de T. Phillips. Major R. M. B. F. Kelly.
	Rivista „ „ „ {	Capt. A. Samut, R. Malta A.
Russia ...	Journal of Artillery {	Major E. A. Lambart. Major G. T. Kelaart.
	Russki Invalid	Lieut. E. G. Cheke.
	Oruzhennii Sbornik	Lieut. E. A. Campbell.
Sweden ...	Artilleri-Tidskrift	—

THE TRAINING TOGETHER IN PEACE TIME THE GARRISON ARTILLERY FORCES OF THE EMPIRE, INCLUDING REGULAR, MILITIA, VOLUNTEER, & COLONIAL ARTILLERY.

BY

CAPTAIN E. G. NICOLLS, R.A.

"IN MEDIO TUTISSIMUS IBIS."

SILVER MEDAL PRIZE ESSAY, 1895.

IN the last ten years great progress has been made throughout the Introduction. Army in the organization and training necessary for the proper conduct of war, and nowhere perhaps has this progress been more marked than in the Royal Regiment of Artillery. In both branches, definite methods, which though not altogether new had remained unrecognized, and untried for many years, have gradually been evolved, for fighting, and training for fighting the different units, until a working, and workable system has at length been elaborated. Most of us no doubt were in hopes that our present system of training was approaching finality, and possibly it is, but in the Garrison Artillery, at any rate, we have evidently not yet reached that end, or else we should not now be asked once more to consider this question. We have now however the great advantage of starting from a good forward position. The necessity for fire discipline, and a regular system of organization and training is no longer disputed. The question no longer is, "Is a system of training necessary," but what system is most applicable to certain requirements? This is the question we have to answer, and to furnish a satisfactory reply we must carefully inquire into the conditions that give rise to these requirements, and the nature of the requirements themselves, before we can say what system of training is best suited to meet them.

As the particular subject of this Essay deals with the training of Artillery Garrisons in Coast Fortresses, I propose to consider it under the following heads:— Division of Subject.

- Chapter I. The general forms that attacks on Coast Fortresses take.
- Chapter II. The particular forms of attack that our Coast Fortresses at home, and abroad will most probably be called upon to meet.
- Chapter III. The kind of defence necessary, and the general duties of the Artillery defenders in meeting these attacks.
- Chapter IV. The system of training that will best fit the defenders to carry out these duties.

The remarks made hereafter apply only to the Artillery portion of

the Garrison of a Coast Fortress, no attempt has been made to deal with the other portions, and where the word "Garrison" occurs by itself it must be understood to refer only to the Artillery defenders.

CHAPTER I. THE GENERAL FORMS THAT ATTACKS ON COAST FORTRESSES TAKE.

The subject of the Prize Essay in 1893 was "The attack of a Coast Fortress." In the July number of the "Proceedings" of that year are published the three Essays adjudged the best. Each Essay approaches the question from a somewhat different point of view, and treats mainly of some one particular form of attack. Written as they are with great ability, and combining as they do evidence past and present, and the contemporary opinion of the best writers who have studied the subjects bearing on this question with the well reasoned conclusions of their own authors, they present, taken together, a very valuable exposition of the whole subject, and one that may be considered in many ways authoritative. I propose therefore to extract from these essays much of the information required for this chapter and to put it forward without any attempt at argument, for which and for fuller information on the subject, the essays themselves should be consulted.¹

A Coast Fortress is defined as consisting of "an area of land and sea provided at certain important points or along tactically selected lines with an Artillery armament partly fixed, partly movable. The area is usually defined by the extent of land or water within range of its guns."² Whatever its area may be, the effective value of any Coast Fortress as such, is limited by the range of its guns over that area. Outside this limit, the Fortress is incapable of affording any protection whatever, unless indeed its Garrison is strong enough to, and provided with, the means of taking the field against an enemy, in which case the operations cease to be those within the rôle of a Coast Fortress.

The rôle of the Coast Fortress may be said to be to afford protection from molestation to everything within its defences, it can best effect this by denying the use of the selected area of land and water it protects, to those whom at the time it may be expedient or necessary to exclude. The specially selected localities protected by Coast Fortresses may be:

- (1.) Harbours and dockyards required for the use of the Navy.
- (2.) Harbours and ports which are required for the use of the Mercantile Marine, and which generally form the approach to important cities or towns.
- (3.) Harbours and ports abroad which can act as temporary refuges, or at least furnish supplies, particularly coal, to the Navy, and to the Mercantile Marine.
- (4.) Harbours abroad which are required as bases of operation for the Fleet, or for Expeditions.
- (5.) Positions guarding narrow water-ways, leading to more open waters which it is desired to deny to all comers.

¹ See "Proceedings," R.A.I., Vol. XX., pp. 345 to 391.

² G.A.D., Vol I., p. 409.

Coast
Fortresses

Use of Coast
Fortresses

An attack on a Coast Fortress may be made by :—

Attacks on
Coast
Fortresses.

- (1.) Naval forces alone.
- (2.) Military forces covered and supported by ships.

The object of the attack may be any of the following :—

- (1.) Conquest and occupation.
- (2.) Passage to some objective beyond.
- (3.) Destruction of the forts, or the ships, stores, and other material that they protect.
- (4.) To cover other operations, for moral effect, or without any very definite object but in hopes of obtaining some advantage.

The first two may be considered as attacks proper.

The last two rather in the light of raids made with a more or less definite object.

The raids naval, or military, on territory adjacent to Coast Fortresses, but outside the range of their guns, which were so common during the wars of the 17th and 18th centuries, and which are undertaken purely for ravage, and destruction need not be considered, as they do not properly come within the meaning of an attack on a Coast Fortress.

NAVAL ATTACKS.

- (1.) With a view to conquest and occupation.
- These may be undertaken :—

Naval
Attacks.

- (a.) By bombardment.
- (b.) By regular attack.

For Capture.

(a.) Bombardment. The ships employed would probably be at long range and under weigh : if after a bombardment landing parties are sent in, the ships would of course have to stand into closer ranges. There are but few historical instances of this method of attack, and it can only be successful against a weak or demoralized garrison.

(b.) Regular Attack. By this term is meant engagements between individual ships, and forts when the object is to silence the fire of the forts, by bringing a superior fire to bear against them previous to the landing of parties to capture them. The term cannonade would seem to be preferable to that of bombardment, to denote the ship's fire action under these circumstances. The engagement would be begun at long, and medium ranges with the ships under weigh, but the final cannonade to be effective must take place at close ranges, and with the ships anchored in the most suitable positions close to the forts ; landing parties would probably be employed at this stage. This form of attack is very rare in history, the most notable instance being the capture of Gibraltar by Sir G. Rooke's Fleet in 1704. It is possible that the gallantry displayed in, and the success of this operation has tended to make us over estimate the value of this method of attack.

(2.) To force a passage. This is a very feasible operation for ships, provided that the water-way is clear, for it is an axiom that guns alone

To force a
Passage.

are powerless to stop ships running past. A fleet so employed would keep as far from the guns of the forts as possible, but the distance, and formation, of the attack must depend upon local conditions such as, state and extent of the channel, &c. There are very few places in the world where opportunity is afforded for this kind of attack, which is not intended to include such an operation as steaming past the forts at the entrance to a harbour only to come under the fire of the inner chain of forts. This method of attack therefore can be attempted only very occasionally as a definite operation, though to some degree it may enter into the operations of a combined Naval and Military attack on a Coast Fortress.

(3.) For the purpose of ravage and destruction. Attacks of this description would take the form of:

(a.) Bombardment.

(b.) Sudden inroads into harbours by small craft, and torpedo boats.

Bombardment.

(a.) Bombardment. As the chief object is to inflict damage, not on the forts but on the property they defend, the fire must be at long range, and accurate, it seems likely therefore that specially constructed vessels carrying mortars, or howitzers, or long range ordnance of some description, will be employed rather than war vessels, and that they will be anchored in positions as far as possible from the forts and clear of their fire also, when possible.

History gives frequent instances of this kind of attack. If ordinary war vessels are employed, the attack would be as already explained in (1a.)

Torpedo boat Attacks.

(b.) The essence of this attack is surprise, and rapidity, torpedo boats, two or three together would appear suddenly before a coast fortress and proceed to run in, as rapidly as possible, past the defences into the inner waters, when they would be able to destroy with their torpedoes any ships lying at anchor, or in dock. Actual experience of this form of attack has necessarily not been extensive, but the little already known tends to show the ease with which such attacks can be carried out, and their extremely formidable nature.

Desultory Bombardment.

(4.) To cover other operations, for moral effect etc. We might call this kind of attack desultory bombardment. It may be undertaken as an operation in itself, for moral effect, or to draw off attention to a distant part of the theatre of war, or it may be part of a regular attack, the object being to divert the defender's attention from the main attack; but whatever the object, the action of the ships would be very similar and would consist of a long range bombardment under weigh.

MILITARY ATTACKS COVERED AND SUPPORTED BY SHIPS.

Military Attacks.

(1.) With a view to conquest and occupation. These can only be conducted against the land defences of a fortress; if these latter are weak or badly manned they may be captured by assault, otherwise they will have to be besieged in regular form. The covering Naval force would generally assist by bombarding the sea fronts at long ranges.

This form of attack is proved by history and generally acknowledged to be the best and most certain method of capturing a Coast Fortress. On this point Admiral Colomb says "We have seen that the methods of attack by expeditions over sea had long been established, and that the idea of capturing ports or islands by Naval force alone was almost entirely out of view. The experience of a century marked by only one or two successes, and many failures of ships against works and almost uniform success of troops, covered and supplied by ships, when numerically sufficient and properly handled had quite settled the plan of attack."¹

(2 and 3.) To force a passage and for ravage. "Troops have been used in the past in conjunction with ships for attacks with either of these objects, and may be so employed in the future, especially in the former case, for the development of submarine mines may make the clearing of a channel such a difficult operation that it may be advisable to land troops to take the Batteries of the Fortress in rear, and if possible silence them before the ships attempt to clear their way through."² The landing of troops merely to ravage territory is not as we have already agreed an attack on a Coast Fortress, and therefore need not be considered.

Forcing a
Passage.

Before concluding this part it would be advisable to briefly consider the general conditions under which the different forms of attack, enumerated above, would probably take place.

Conditions
governing
Attacks.

All operations into which the state of the sea enters as one of the conditions, must depend upon the command of the sea, and in this respect it may be noted that, "the command of the sea must be fought for if it is not admitted, and territorial attacks must cease while this process goes on. They cannot be undertaken at all whilst the command is in abeyance; but after it is settled, the side that holds it, inevitably pushes on to the attack of territory"³ and that on the 'State' of the sea at any given time depends the probability and nature of any attack on hostile territory. These 'States' of the sea have been classed by Admiral Colomb as that of 'indifference' 'when neither side attempts to hold command of particular waters and therefore which neither side threatens'⁴ of 'disputed command' and of 'assured command,' 'and evidently these must be a continual passing from one state into a higher and back again'⁵ so that we get states of temporary command lasting for longer or shorter intervals. Further "if we take these three states of the sea into our contemplation as conditions under which expeditions across it succeed or fail, we may note, that over a commanded sea no such expedition can be put in force at all by the inferior Naval Power, except by evasion, else must we admit a sea which is of disputed command or one

¹ "Naval Warfare," p. 377, by Rear-Admiral P. H. Colomb.

² R.A.I. "Proceedings," Vol. XX., p. 394. Commended Essay.

³ "Naval Warfare," by Rear-Admiral P. H. Colomb, p. 309.

⁴ Ibid p. 207.

⁵ Ibid p. 212.

that is indifferent; on the other side the Power in command of the sea ought never to fail in any attack it undertakes so long as it does not cut itself off from its sea communications."¹

Value of
Command of
the Sea.

If therefore we have a Navy powerful enough to assure the command of the sea, we need not fear attacks in force on our Coast Fortresses; but, as to command the whole seas requires an immense, and vigilant fleet, and as it is in the power even of an inferior fleet, or of an expeditionary force to evade a superior hostile fleet, we may have to be prepared even under the most favourable circumstances to meet some forms of attack, especially in distant waters where owing to their remoteness our command of the sea may not at the time exist in fact, or may have been temporarily lost. Here however such attacks can only be successful where there is sufficient time for their completion, if the capture of the place can be delayed sufficiently long, relief must come, and the failure of the expedition be certain, as witness the reliefs of Gibraltar in 1704-5. Now more than ever when the movement of ships and the duration of voyages are no longer dependent on fickle and variable winds, the power of relieving distant fortresses seems to be more firmly assured than heretofore, to that side which has command of the sea. As Admiral Colomb says "The general result of improved Marine Architecture therefore must be to put a check on all territorial attacks which depend upon an indifferent sea; as the same cause must tend to make a doubtful command of the sea more doubtful, and a command of the sea more assured, the general result would appear to be rarer opportunities for territorial attack across a sea which is not commanded but much more certainty in the results of expeditions carried on by the Power which holds a command of the sea that cannot be challenged."²

The introduction of a time element into the conditions of successful defence under certain circumstances would point to the conclusion that the value of a Coast Fortress may often lie rather in its capacity to delay capture, than in its ability to resist it altogether.

For Capture.

It may be presumed that as a general rule no attack on a Coast Fortress will be attempted unless there is some reasonable probability of success attending the attempt. It remains therefore for us to ascertain under what conditions success is likely to attend the different forms of attack already enumerated. We will take them in the order in which they have been considered above.

NAVAL ATTACKS.

Naval
Attacks

(1a.) Bombardment for Capture. This implies the existence of a temporarily commanded, or at least an indifferent sea, for no ships would waste their ammunition in bombarding a fortress with an enemy's fleet near enough to attack them before they can replenish their ammunition.

(1b.) Regular Attack by ships is out of the question except command of the sea is assured for a sufficiently long time, not only to permit

¹ "Naval Warfare," by Rear-Admiral P. H. Colomb, p. 212.

² Ibid p. 216.

of the ships making up the ammunition they had expended, but also to allow them to repair the damages they must receive, even in a successful attack, before they may be called upon to meet a hostile fleet.

(2.) Forcing a passage. There seems no reason why this should not be attempted in any "State" of the sea, provided that the ships undertaking this attack are not being actually watched by an enemy's fleet, which bring them to battle, and that when they enter the waters beyond they will be free from attack.

Forcing a
Passage.

(3a.) Bombardment for destructive purposes. To place a flotilla of specially designed vessels (probably in no sense sea going) in a position to shell a fortress, and to keep them there long enough to effect their object, would seem to imply a fairly assured command of the sea; bombardment by war vessels for this purpose under any other conditions than this could only be of a desultory nature.

Ravage and
Destruction.

(3b.) Raids by torpedo boats. From the very nature of this attack it would not be unreasonable to assume that no "State" of the sea could prevent its being attempted.

(4.) Desultory bombardment. When this is undertaken to support a military attack it is necessary that there should be at least a temporary command of the Sea assured for a sufficient time to afford reasonable prospect of success. If this is attempted for any other purposes, a temporary command of the Sea at least is necessary, unless the ships so engaged are prepared to sacrifice themselves, if required, to attain their object, or unless the places attacked are near enough to their bases to allow the ships a reasonable chance of retreating, and refitting there; otherwise they render themselves liable to defeat, and capture at the hands of an inferior Naval Force. In these exceptional cases, the attempt may be made in any "State" of the sea.

Desultory
Bombard-
ment.

Military Attacks. It may be taken for granted that no form of military attack whatever, will be undertaken unless there is a command of the sea sufficiently assured to afford reasonable prospect of success. The only possible exception to this is the case of a force which succeeds in effecting a landing on territory by evasion, but unless the territory invaded is likely to be friendly to the invaders they will find themselves cut off from their supplies, and reinforcements except they have the command of the sea.

Military
Attacks.

CHAPTER II. THE PARTICULAR FORMS OF ATTACK THAT OUR COAST FORTRESSES AT HOME AND ABROAD WILL MOST PROBABLY BE CALLED UPON TO MEET.

It can hardly be expected that with Coast Fortresses situated all over the world, some close to a possible enemy's Naval Stations, some in mid ocean, some guarding important Naval dockyards, others protecting coaling stations, &c., that all will be liable to the same form of attack. Mauritius might be captured by a force that would not attempt to attack Bombay, and Portsmouth might be the object of a form of attack, that would be impossible, or thrown away against St. Helena. Each Coast Fortress will be liable to some forms of attack rather than others.

General Con-
siderations.

Division of
Subject.

It must be our endeavour to ascertain as far as possible the forms this liability will take in different cases. This can only be done very generally, for to attempt to classify all our Coast Fortresses with their differences of importance, locality, armament, types of fort, etc., would be, even if capable of satisfactory accomplishment, a task quite beyond the limits of this essay. There appears however to be one broad distinction which for the purpose of this essay would seem particularly suitable, because it is largely based upon the nature of the garrisons that will be employed to defend different fortresses. To all our home fortresses are allotted in addition to the R.A. Companies serving in the district certain units of Militia and Volunteer Artillery, to whom a share in the defence of the fortress is confided, while those abroad can only count on their existing garrisons, which as far as India and the Crown Colonies are concerned are composed of the R.A. while the self-governing Colonies find troops of their own, to take up the work of the Defence. This distribution of the Garrison gives us a division of the subject into

In space.

- (1.) The defence of Coast Fortresses at home.
- (2.) The defence of Coast Fortresses abroad, *i.e.* outside the United Kingdom.

It may be noted that this method of separating the subject practically puts into one class all the most important Fortresses, viz :—Those at home, while it leaves those classified as “abroad” as descriptive with one, or two exceptions, such as Malta, Bombay, &c., of the less important ones. These exceptions if they approximate closely in importance to the one class, approach from their geographical position still closer to the second, in their liability to particular forms of attack, and it seems probable that the principles of their defence should be conducted with slight additional modifications on the same general lines.

In time.

But as we thus have a division of the subject in *space* depending practically upon the geographical position of each Fortress, so it will be convenient to formulate a division in *time* depending upon the stage hostilities have reached at the time an attack is made. This division can most easily, and appropriately be made into :—

- (a.) On the outbreak of hostilities including the period when they are imminent.
- (b.) During the progress of the war, when the Command of the Sea is held by ourselves.
- (c.) During the progress of the war when the Command of the Sea is doubtful, or only temporary, in certain seas.
- (d.) During the progress of the war, when the enemy has obtained an assured command of the Sea.

I think it will be apparent that some such division of the subject as this is needed, and will tend to a clearer understanding of what may be expected to happen under varying conditions. I propose therefore to examine the question of probability of attack from a combined view of the conditions due to difference in time and place.

(a.) At Home. Every effect will be made by each Naval Power when hostilities are imminent, to place every available ship that is fit for the line of battle at sea, in order to assure the supremacy of its own Navy and to obtain as early as possible the Command of the Sea. At the outbreak of hostilities therefore, it may be expected that no attacks by ships on Coast Fortresses are likely to be attempted. As has been pointed out, however, by Major Elmslie, R.A.,¹ the individual value of a war vessel to the Power to which it belongs is now so very much greater than it use to be, owing to the time, and money required for its construction, and the impossibility of building new ships to replace those put out of action during the probable continuance of a modern war, that it is very decidedly to the interest and advantage of both sides (and of the probably weaker Naval Force in particular) to endeavour, while fitting out their own fleets, to harass the enemy engaged in a similar operation, and if possible destroy his battle-ships in their own ports. That this is quite feasible, and that the best way of effecting it now, is by a torpedo boat attack, a perusal of the Prize Essay 1893 makes sufficiently plain. Torpedo boat attack then, is a form of attack extremely likely to be experienced by all our home fortresses, within whose defences ships of war are to be found, but it does not appear that any other serious form of attack is to be apprehended at this stage of the war.

Outbreak of
Hostilities at
Home.

Abroad. Those of our Fortresses abroad which were situated within striking distance of an enemy's Naval base, and within whose defences ships of war are to be found would also be liable to attacks by torpedo boats, and must be prepared to meet them, but with our smaller fortresses, and defended coaling stations in distant waters, such attacks need not be feared. At the most bombardment either with the idea of capture, or of the nature I have termed desultory, is all that need be apprehended.

(b.) At Home. When during the progress of a war the assured command of the Sea has been obtained by our own Navy, the threat to our Coast Fortresses at home will cease almost entirely if not altogether. But unless the enemy has been very badly beaten, or is unusually wanting in daring and enterprise, it seems probable that he will still from time to time attempt raids by torpedo boats on our ports, and against these we must still be prepared. Any other threat to the home fortresses is out of the question, and therefore the Garrisons that have been allotted to them can with safety be considerably reduced and will be available for employment elsewhere. In what manner they will then be employed is a question of war policy which is not for us to decide, and which has probably been already considered and settled by the proper authorities. But as in the words of the late General Hamley "it does not follow because an army is defending a territory, it must confine itself to the defensive; on the contrary it will best effect its purpose by actively threatening its adversary, and by taking the lead wherever the opportunity offers,"² so it is not unreasonable to antici-

When Com-
mand of
the sea is
assured.

¹ R.A.I., "Proceedings," Vol. XX., p. 346. Gold Medal Prize Essay.

² The operations of war, p. 48.

pate that the forces thus freed from the Coast Fortresses will probably be employed in expeditions against the enemy's territory. Further, it would be quite legitimate to expect that, as any European Power with which we might find ourselves at war, possesses an Army to defend its own home territory, many times larger than our available force, and as it would be folly to place ourselves in a position where we could hardly help being beaten by a much superior force, any attacks we might contemplate on this Power's territory would be directed against its outlying possessions and Colonies, and would be of the nature of those Military expeditions so common in the History of the Naval Wars of the seventeenth and eighteenth centuries.

Abroad. With the Command of the Sea assured, our Fortresses abroad would probably be exempt from any attack, for as Admiral Colomb says, speaking of the French raids in the West Indies during 1710 and 1711, "These attacks where the force employed is small, where the distance to be passed over the sea is short, and where if a successful landing is effected, capture of the whole territory may follow, constitute perhaps the limit within which there is any chance at all of a successful attack on territory by the inferior Naval Force."¹ When the command of the Sea is lost to any Power, its Naval Force in distant waters is likely to be very inferior, especially in the face of our own Naval strength, and unless the above conditions are existing, even this form of attack cannot take place, much less any on a greater scale requiring serious defensive measures to resist it.

(c.) At Home. As long as the Command of the Sea remains doubtful the Fleets in the home waters on both sides will be too much occupied with each other's movements to pay any attention to the attack of Coast Fortresses, and no expedition against them, that will be liable to interruption from the Sea will be possible. As long as this state lasts therefore our home fortresses will not probably be liable to any other attack than that of torpedo boats and perhaps desultory bombardment by occasional cruisers. If the enemy obtain a temporary command, invasion may be possible, but this will not affect Coast Fortresses as such.

Abroad. The case however with our Fortresses abroad may under these circumstances be quite different. The greater part of our Fleets will be employed in their legitimate work of trying to obtain the command of the Sea. It is possible therefore that in distant waters the enemy may have a command which, though perhaps only temporary, will be his long enough to enable him to attempt the conquest of territory lying in those seas. In this case it seems probable that expeditions will be attempted against those places likely to be most easily captured and held, and which like our small coaling stations will be of value to him when taken, proportionate to the loss that their transfer will be to ourselves. These attacks may be made in any of the ways before mentioned, but the only form of attack that can be really successful against a properly armed, and manned fortress is that, which is

¹ "Naval Warfare," p. 321.

delivered by a sufficiently strong Military Expedition. The chances of the fortress attacked making a successful defence, depend therefore upon its power to meet an attack from the land side, and its ability to prolong its defence for a time sufficient to allow of relief arriving. Large fortresses requiring a very considerable force to capture them are not likely to be so attacked, but may expect to have to meet desultory bombardment, or even one carried out by special vessels for destructive purposes, if their nearness to an enemy's Naval base permits of this being attempted without interruption; and with a reasonable chance of success.

(d.) At Home. The day which sees the Command of the Sea held by our enemy will indeed be a distressful one for England. Then is made the first certain step to an invasion of these Isles, the consequences of which it is not pleasant to contemplate. Assuming this condition of things to occur, it is not clear how our Coast Fortresses could play any sufficient part in helping to ward off an invasion. For the invading force would probably be landed on some convenient part of our open Coast line, and would be under no necessity to approach any of our Coast Fortresses unless it was found that its presence threatened their base and communications, in which case a determined assault on the land front would probably give the place into their hands. For it seems highly improbable from political reasons arising out of the panic that would be created by an invasion, that the very large garrisons that would be required to defend the land fronts of our large fortresses, like Plymouth or Portsmouth, would be permitted to remain to do so, while London was threatened; but rather that a considerable portion of them would be withdrawn to assist the Field Army in resisting the advance of the invading forces, if only to reassure the panic-stricken inhabitants of the capital. But assuming that this would not be done, and that the necessary garrisons were left in the Coast Fortresses to hold them, the chief part they would have to undertake in the event of attack would be the defence of their land fronts; for though no doubt whenever it was considered imperative to reduce such a fortress, the land attack would be assisted by naval operations on the sea front, still these latter will have a less chance than ever of being successful by themselves for it will be in the power of the defenders to completely obstruct their own waters with mines, torpedoes, &c., without fear of injuring their own shipping (which must anyhow fall an easy prey to the enemy), and thus to keep the enemy's ships at long ranges from their forts; so that if the speedy capture of the place is desired, as it will be, the real attack must be made against the land defences.

The command
of the sea
being lost.

It has not been thought necessary to consider the question of invasion under any other conditions than that of the assured command of the Sea, to the enemy. The only other possible condition is invasion by evasion, that is by eluding our Fleet, and throwing a force on to our shores, that must take its chance of making its own footing and being able to obtain supports, and reinforcements as required, after it has landed. This is such a very risky operation that it can be only undertaken when the invading force is likely to receive assistance from the

people of the country it invades, as in the instance of William III. landing at Torbay, or Hoche's expedition to Bantry Bay. Where this assistance is not forthcoming, we have only to recall the inaction of the French after the battle of Beachy Head, and the failure of the enormous expeditions that from 1797 to 1805 Napoleon collected for the invasion of our shores, even to put out from their own ports, to show that while there is a fleet in being on the other side, the hazard is so great as to be prohibitive.

Abroad. As regards the position of our Coast Fortresses abroad, when owing to the command of the Sea being lost, they can no longer look for, or expect relief when attacked. All that can be said is, that their fall into the enemy's hands is certain, provided that he attacks them with sufficient force, and in the proper manner, that is by military expeditions. All that the Garrisons can do (and probably will do) is to delay the day of capture in the hopes of something turning up, but to do this they must be prepared to meet the main attack on land which should be really the only formidable one.

CHAPTER III. THE KIND OF DEFENCE NECESSARY, AND THE GENERAL DUTIES OF THE DEFENDERS IN MEETING THESE ATTACKS.

The preceding chapter has served to show the forms of attack to which our Coast Fortresses will be most liable under different conditions. In Chapter I. we sketched the general lines on which each attack is likely to be carried out. It is not difficult then by combining the two to arrive at the kind of defence that will be most suitable for each case, and the work that will therefore be required from the Artillery Garrison to meet them. Keeping to the same division of the subject as was made in the previous Chapter it will be seen that—

Nature of
Defence.

(a.) At Home. For the purpose of repelling torpedo boat attacks and as far as the Artillery defence only is concerned, quick-firing guns are likely to be the most useful¹, other guns might be employed at times with advantage, but whatever nature of ordnance may be used it seems certain that it must be capable of being fired rapidly, and that smokeless powder, laying over the sights, and a system of rapid ranging must be employed; extraneous aids in the way of range-finders, &c., will generally be impossible. If desultory bombardment is attempted it would be carried out at long range by ships under weigh and could be effectively replied to by most of the heavy guns mounted in our Coast Fortresses.

Duties of
Defence.

The general duties of the defenders will be the manning of the quick-firing and other guns employed against torpedo boats (a system of fighting which has yet to be adopted) and possibly the manning of the heavy guns in the manner explained in the Drill-book.

Abroad. Fortresses that are liable to torpedo boat attacks require the same means of defence, and the same duties from the defenders as those at home. But in addition they, with the other smaller fortresses,

¹ See R.A.I. "Proceedings," Vol. XX. Gold Medal Prize Essay.

will be liable to bombardment either with a view to capture, or of a desultory nature; the former is only likely to be attempted against small fortresses, and differs from the latter only in that being undertaken with a definite object it may be expected that it will not be abandoned without an effort being made to land storming parties from boats.

Against bombardment the heavy guns will be required, for the boat attacks the light guns supplied for general defence will be chiefly used.

The duties of the defenders will then be:—

- (1.) To man the heavy guns which will be fought by depression range-finder or position-finder according to the means available.

Duties of
Defenders.

- (2.) To man the light guns for general defence which must usually be fought without the aid of these adjuncts.

(b.) At Home. The portion of the Artillery Garrison that would be left in our home fortresses must be sufficient to man the guns for defence against torpedo-boats, and perhaps a few of the heavy guns for general purposes. The remainder of the men who are to be employed in expeditions abroad will be required to make up the Siege Train which must accompany every such expedition if its success is to be insured. The duties of the larger part therefore will be to man the Siege Train.

Means of
Defence.

Abroad. The fortresses abroad must remain in a state of preparedness to meet any *possible* attack, but no serious attack need be anticipated.

Duties of
Defenders.

(c.) At Home. The defence will be as indicated in (a) but the heavy guns required for engaging bombarding vessels may have to be more frequently employed, and consequently this form of defence may assume a greater importance.

Abroad. Fortresses abroad according to their situation, strength, and the local conditions, influencing the enemy at the time, may be subjected to any form of attack; all purely Naval Attacks on its sea faces alone, a properly armed and commanded fortress should be capable of repelling, and no really serious danger should threaten it until the enemy has landed troops to attack it from the land side. This is the point on which the defender's attention must be concentrated, and against such an attack the guns for general defence will not alone be sufficient, they must be supplemented by howitzers and siege guns of sufficient calibre to cope with the ordnance that the enemy would employ, for what virtually become siege operations.

Means of
Defence.

The defenders therefore will be required to man the different guns they possess according to the nature of the attack, but principally to fight the ordnance employed to resist attacks from the land side.

Duties of
Defenders.

(d.) At Home or Abroad. When the command of the Sea is lost, Coast Fortresses wherever situated must if attacked make the best defence possible. To meet attacks, which are not likely to be made except in sufficient force, the whole armament and all the energies of the de-

fence will be required, but here again attention must be chiefly turned to the defence of the land fronts on which the main attack will be made, and for this purpose siege ordnance are required. If bombardment by specially prepared vessels is attempted, either by itself, or in conjunction with a regular attack, it can best be met by high angle fire guns adapted for long range shooting in any direction, and some of these should be supplied, at any rate to all our most important fortresses.

Distribution
of Garrisons.

Before proceeding to consider the question of how the Artillery Garrisons can best be trained to carry out the general duties here indicated, something must be said regarding the manner in which the distribution of the garrisons to these duties should be carried out. Some such distribution it will be admitted is necessary especially in our home fortresses where Militia and Volunteer Artillery are called upon to take their share of work with the Royal Artillery. It may be laid down as an axiom from which no general dissent will be made, that when a variety of work has to be done, as in the manning and defending of our Coast Fortresses, it will be more efficiently performed, if the same men are always told off, and kept to the same work, and that when the nature of the work varies, the most important should be allotted to the most efficient men. A Coast Fortress therefore should be divided into a number of commands, and a portion of the garrison of it should be permanently allotted to each command, and kept entirely to its own command. In the home fortresses where the garrisons are composed partly of companies R.A. and partly of Auxiliary Artillery, the companies should be allotted to the most important works as far as they will go, and the Auxiliary Artillery to the remainder. Abroad where Colonial troops are found, who have to work with the R.A., a similar distribution should be made. Where only Royal Artillery Garrisons are found, it is immaterial how the distribution is made, as also in those fortresses manned entirely by the Colonial Artillery, but the distribution once made, should not be altered unless absolutely necessary. This distribution should be embodied in the Defence Scheme of each Fortress, which as far as this question is concerned should be drawn up, on the following general lines.

Defence
Scheme.

(1.) A distribution in time. It must be recognised that after the order for mobilisation has been given, some appreciable time must elapse, before the different units can assemble at their place of concentration, and that while they are assembling, the forces told off to each Fortress, and that are on the spot, will alone be available; these will consist of the R.A. Companies stationed in the Fortress, and probably a considerable number of the local Volunteers. As soon as the Militia are mobilised, and reach their place of concentration they will relieve the Volunteers. Thus two periods must be provided for, viz :—

1st period, Royal Artillery and Volunteers available.

2nd period, Royal Artillery and Militia allocated to the Fortress.

(2.) These forces should be told off into Battery commands, a definite portion of the armament being allotted to each command. As many Battery commands as may be convenient will constitute a Fire command.

Each Battery command must consist of Royal Artillery only, or of Militia or Volunteer Artillery only (according to the period of mobilisation) each corps being under its own officers. Fire commands should be arranged in the same manner, if possible.

(3.) The apportionment of these commands should be on the principle already advocated of allotting the most important to the R.A.

(4.) In allotting the details required for any command allowance should be made for two reliefs at least.

(5.) Fire Commanders and Officers holding higher posts should be specially selected, and appointed by name, being commissioned as such if necessary.

(6.) All specialists required for range-finding, hydraulic mountings, &c., must be found by the R.A., and will be in addition to the battery details. These must be provided for the Auxiliary Artillery as well, and only to this extent is a mixture of corps permissible. Some of these provisions are applicable only to the home fortresses, or with slight modifications to those abroad which may be manned by mixed garrisons, but the principles on which they are based are of universal application.

A distribution of the Artillery Garrisons made on these lines would much simplify the question of training for it would provide:—

Advantages
of
distribution.

(1.) That Battery commands should be kept separate, thus allowing the men of each corps to be trained and worked under their own officers.

(2.) That each Battery command was told off to a specific portion of the armament, thus admitting of the duties of the different units being more clearly defined and separated.

(3.) In our home fortresses that generally speaking, the dividing line of duties between the Royal Artillery and the Auxiliary Artillery can be more clearly marked.

This is important as it affects the question of the training of the different corps.

The actual distribution of duties between the R.A. and the rest of the Artillery Garrison in home fortresses can only be settled locally, with due consideration to the requirements of each Fortress. But bearing in mind that the most important portions of the defence must be given to the R.A. Companies, and also that these latter are liable to foreign service and with it varying duties in different localities, it should be the endeavour when distributing them at home to apportion them as far as possible to those means of defence which will be of most value under all circumstances. The distribution at home then should generally speaking be as follows:—

The actual
distribution.

The Royal Artillery to—

(1.) The quick-firing guns and other ordnance intended to repel torpedo boat attacks.

(2.) The movable armament or guns for general defence, which will

be required against landing parties, and which must play an important part in the defence of fortress abroad.

(3.) The most important heavy B.L. guns, and long range guns, &c., as far in each case as the available strength of the companies will permit.

The Auxiliary Artillery to—

The general fixed armament which will for the most part be composed of heavy R.M.L. guns, commencing where the R.A. have left off (at the most important), and working down to the less important as far as the available strength permits.

CHAPTER IV. THE SYSTEM OF TRAINING THAT WILL BEST FIT THE DEFENDERS TO CARRY OUT THESE DUTIES.

General Considerations.

If the views put forward in the preceding pages with regard to the probable forms of attack on our Coast Fortresses, and the nature of the defence required to meet them be accepted, it must be admitted that the duties of the Artillery Garrisons will not be confined to the fighting of the heavy guns mounted in fixed emplacements, but must include the service, and ranging of many descriptions of light and medium ordnance, and that this class of ordnance will if anything be in more constant use, and of greater relative value, to the defence than the heavy guns. It will not therefore be sufficient to train our gunners only in the system of fire discipline, and organisation explained in the drill-book, as applicable to the working of heavy guns, they must also be taught the best method of working and fighting, the guns they will be required to man under the varying conditions of actual warfare. It cannot be said with truth that the drill-book contains *no* information regarding the method of employment of the lighter guns, but I think it must be admitted that the chapters on Coast Defence deal so, almost exclusively with the system of fighting heavy guns against ships, that it has come to be a matter of general acceptance that this kind of action will constitute if not the whole, at least the most important part of the Garrison gunner's duties in war-time. The system of training accordingly, has been largely based on this implied assumption, and drill and training with the lighter guns, that make up the movable armament of a fortress, has been considered of only secondary importance.

Value of heavy guns.

It has been my endeavour in the preceding pages to show that the occasions on which the garrison gunner will be called upon to man his heavy guns will be few, compared to those when the movable guns will be wanted, and that when these latter are wanted they will always be required to repel an *important* attack, while the former may frequently only be employed, when they are required, in what will be little more than interesting practice.

System of training.

If this view is correct, it is clear that a system of training to be complete, and satisfactory must be based upon the requirements of the movable natures of guns, though it should admit of adaptation without difficulty to the special requirements of the heavy guns, our present system has been evolved on exactly the opposite principle and in some points is not well adapted to the working of lighter guns on travelling

mountings, which have to be fought in different positions and under varying circumstances. Are we then to abandon the system of fire discipline, &c., under which our Garrison Artillery has been trained for the last several years? I trust not; for it is a system that has done much good service, and undoubtedly gave, when it was first started, a much desired impetus to the training of the Garrison Artillery. But I think we ought to recognise *now* that we have hitherto taken a somewhat exclusive view with regard to the *rôle* of Coast Fortresses, and be prepared to modify our system as necessary, to bring it more in accordance with the probability of things. This we can do the more readily because the system being in itself a sound one no very great changes are necessary: violent changes seldom lead to immediate beneficial results, and gradual modification to suit new circumstances is the law of healthy change. Let us see then what kind of system of training is required, and how far the present system as given in the Garrison Artillery drill-book needs modification.

In the first place it will be observed that as all Garrison Artillery Companies are liable to foreign service and with it different duties in different stations, while the Militia and Volunteers are only required for home defence, it is probable that the former will require a wider, and more general training than the latter; for while the training of the one must be such as to fit all Companies to perform the different duties they may be called upon to undertake in different places, the training of the other need only be such as to best fit them for those particular duties to which they are allotted in the fortresses they garrison. It will, therefore, be advisable to consider the method of training each corps separately before we come to the question of how they can best be trained together.

Difference of
Conditions

This liability to foreign service will always be the great difficulty in the way of organising, and training the Garrison Artillery Companies in the manner which otherwise might theoretically be the best. We cannot say that such, and such companies shall be permanently trained to fight heavy guns against ships, such, and such others as Siege Train Companies, and others again to quick-firing guns &c.; for to do so means, that some companies will not be liable to service abroad or liable only to service in certain places abroad, some companies thus always getting the good stations, while others have to be satisfied with the less desirable ones, some companies getting long periods of home service, whilst others cannot expect more than a brief spell at home between two long tours of foreign service. Desirable therefore as it doubtless would be, to have the different kinds of Garrison Artillery work permanently specialised, it does not seem that this is likely to be feasible with due regard to the exigencies of the service, and the training of Companies therefore must be conducted on the principle of general foreign service, and consequent liability to different duties at different times and places. To meet then the various demands that may be made on Garrison Companies their training should be of two kinds.

Royal
Artillery,

(1.). A general training, embodying the simplest applications of the

principles that underly the successful fighting of all guns.

(2.) A special training, in the particular application of these principles to the fighting of those guns, to which each company is for the time being allotted.

Training.

Before going further it will perhaps be of advantage to explain what is meant by the term "Training," which must not be confused with the word instruction. Thus, training is the term applied to that special form of instruction, which is employed to fit a soldier for the specific duties he will be called upon to perform in time of war; while instruction denotes the imparting to him of knowledge that may often be of great service to him, but is not absolutely necessary to the performance of his specific duties. An Infantry soldier is trained to use his rifle, but he may be instructed also in gun drill. Training therefore includes instruction of a definite description, while instruction does not necessarily mean training.

General Training.

The principles which underly the successful fighting of all guns include, and may be divided into:—

- (1.) The correct service of the individual gun.
- (2.) The method of laying.
- (3.) The service of the combined pieces, *i.e.* the fire discipline of the battery.
- (4.) The method of ranging, which includes observation of fire.
- (5.) The chain of command, and means of communicating orders from the commanding officer to his subordinates.

The simplest and most general application of these principles is:—

(1.) Service of the piece. To be simple this must be as uniform as possible for all types of guns B.L. or M.L. An endeavour has been made of late years to obtain this, by keeping as far as possible the same numbers to the same duties with all guns. Nomenclature should also be uniform, and either the term "Gun Captain" or the term "No. 1" universally adopted, and not as at present, the N.C.O. in charge of a detachment called a Gun Captain when in charge of a 9-in. R.M.L. gun and a No. 1 when working an 8-in. Howitzer. These little differences tend to confusion, and to the idea that the drill of different guns must necessarily be wholly different.

(2.) Laying. The most universally useful method of laying is over the sights by aligning them on the target. Great importance has rightly been attached to this method, as it is the foundation of all laying, and every encouragement has been given to men to make themselves good layers.

(3.) Fire Discipline. This must be of the most simple, and general description; the groups should consist of two guns each, the working of them should be carried out quietly, and rapidly, orders should be by word of command or signal, and the rates, and orders of fire should be as simple as possible. Here again uniformity in nomenclature would tend to simplicity, and either the term Group Commander or Group

Officer should be universally adopted, similarly the Group command for all guns should be either "commence firing" or fire No. — gun.

The method of fighting guns up to this point concerns chiefly the N.C.O.'s and gunners, and comprises the essential part of their general training, the remaining portions, viz. the ranging and communication of orders, as far as the rank and file are concerned constitute merely an amplification of fire discipline, but their methods should be equally simple and capable of comprehension by all.

(4.) Ranging and observation of fire. All ranging rests on the bracket system, and every method of observation of fire is merely an extension of the method of visual observation aided by field glasses or telescopes. These are the fundamental and necessary methods.

(5.) The chain of command, &c. This must always be the same, viz. from the commanding officer through his subordinate officers to the gun captains, and detachments, and the simplest means of communication is by word of command, or signal between each link in the chain, all being in positions where this can easily be applied.

These are the principles on which the general training of all ranks, officers and men, should be conducted, and the simplest practical application of them is to the working of 4 or 6 light guns on travelling carriages, divided into groups of 2 guns each, and placed in open battery and close enough together to be all under the eye of the commanding officer, and within reach of his voice, so that the means of communication may also be simple; the method of ranging can be made equally simple by employing standing targets at medium ranges where visual observation of fire is possible, and easy. These are in fact the conditions of Field Artillery fire-action in their simplest form, and they are equally applicable, and necessary to the general training of the Garrison gunner. Instead however of using field guns, the guns composing the movable armaments of fortresses should be employed for this purpose. This would have the great additional advantage of basing the general training, of the Garrison Artillery on the service, and method of working that class of gun which they will most frequently be called upon to man in time of war. These guns are already supplied in sufficient numbers as "movable armaments" to be available for purposes of general training but where they are not conveniently parked for the use of companies, there seems no reason why other guns should not be issued for this purpose, especially as there must be numbers of them in store, and as it is not a matter of importance that they should be all of the same calibre or type. On the contrary seeing the different types of guns we have in the service, and the necessity for training the men in the use of them all, the ideal instructional battery for general training should consist of six guns made up, say of two 40-pr. R.M.L., two 40-pr. R.B.L., and two 4-in. B.L. guns; the actual calibre supplied is not of importance, provided that, the guns used belong to that class which are now issued as the movable armaments of Coast Fortresses. The general training carried out on these lines having being completed each Company will pass on to its special training, but should annually as a preliminary to the drill season, be regularly put through the course of general training.

Practical
Training.

Special
Training

The special training will consist in the particular application of the principles learnt in the general training, to the working of those guns to which each company is specially allotted, and generally speaking will include :—

(1.) Service of the Gun. This will be modified according as the guns are B.L., M.L., quick-firing, or siege ordnance, and will include instruction in the special mountings belonging to them.

(2.) Laying. The methods best adapted to the particular guns will form the subject of training.

(3.) Fire Discipline. What modifications of the general system are necessary for most effectively fighting these guns must be taught. The number of guns in a group may be varied to suit local requirements.

(4.) The method of ranging may be modified by, the means of range-finding, or observation of fire, that is most suitable.

(5.) Communications, &c. The means employed depend upon the relative positions of the various units in the chain of command, and the appliances to hand, and must form the subject of training.

By following this plan each Company will receive a general training on the same lines, and on such lines as will enable it without much difficulty to pass on to its special training, which will be solely according to its special requirements, thus a Company told off to fight a battery of heavy guns against ship attacks would be specially trained in the method of so doing, while another detailed for duty with the howitzers of the general defence must be specially trained in siege work, and neither need for the time being have any particular knowledge of other branches of Coast defence ; as soon however as they move on to other fortresses and have new duties assigned to them, their special training in these must recommence. Beyond this point, training ceases and instruction commences, and how far this should be carried on cannot here be decided.

Specialist
Training.

To the complete performance of the fighting duties of the Garrison Artillery a further training which we may call "Specialist" is necessary. By this term is meant instruction in the use of the many adjuncts that are now employed in both Coast and Siege Artillery practice, and which includes such items as depression range-finder, and position-finder specialists, observers for siege artillery fire, specialists for electrical communications, artificers for complicated mountings, &c. For these special duties which require special instruction, and which will not, according to the views I have put forward, in the preceding pages be of general use, specially selected, and trained men are required, and should alone be employed. This has been recognised by the appointment of such men as specialists, but in addition to the District specialists others have been allowed to companies both for range-finding and as gun layers. As regards the latter they should not be considered as specialists in this meaning of the term ; laying must be considered as an important part of the general training, and though it is right, that men who show a particular aptitude for laying, should be selected as

gun layers, and paid as such, they belong essentially to the Company and to the Company only, and therefore should not be given a designation which is apt to be misleading. Outside the Companies there should be no gun layers recognised. The district establishment of range-finders should be sufficient to supply all wants, and do away with the need for any Company specialists. So that all specialists should belong to the district establishments, which are distinct from the Companies, and all gun layers to the Companies only.

A reference to Chapter II. will show that the Garrison Artillery may in time of war be not infrequently called upon either to form a siege train, or to man siege ordnance in defence of their fortresses from land attacks, it seems clear therefore, that a sufficient portion of each Company's special training should at times be devoted to this work. At present only three or four Companies are trained in siege work; their number might well be increased, and if it is not possible as is most certainly desirable, that the siege train should be permanent as such, it is at any rate possible to put more Companies through this training annually. Each Company should in turn go through a three years' course, and there should be at any one time, three Companies at least from each Garrison Artillery division going through this course, each Company being in a different stage of instruction. By shortening the course at Lydd to 6 weeks, and by arranging the Companies so that one from each Division attended each course, three siege divisions of three companies each could annually be trained at Lydd, without interfering to any great extent with the armament work of districts. There would thus be each year a fresh Company learning siege work. All such Companies when not at Lydd should be told off as far as possible to the movable armaments in their districts. The other Companies in the division which are at home being trained for the time either in the working of quick-firing guns, or of the heavy guns for the attack of ships as required. But special attention must be paid to the means of repelling torpedo boat attacks, and for this purpose some practical system of ranging and working quick-firing guns is specially needed.

Distribution
of Companies.

In fortresses abroad the same system of general and special training will be necessary, while in the Colonies again the training should be carried out on the same lines, but as siege work is not likely to form an important part of their duties, the general training should be sufficient to meet and repel possible landings, while those portions of the force told off for the Coast Defence proper should be specially trained to the duties pertaining thereto.

Abroad and in
the Colonies.

When we come to consider the duties of the Auxiliary Artillery at home we are met with a different state of requirements. Brigades are permanently told off to certain Fortresses, the men are not liable for service abroad, and therefore the whole duty of each unit consists in the proper handling, and fighting of those guns to which they are allotted in the scheme of defence. Their training therefore requires to be only to this end, and the general and special training are merged into one particular system of fighting special guns. But to ensure sound and efficient training this should be conducted as with the com-

Training of
Auxiliary
Artillery.

panies R.A. on the basis of the battery command being the unit for training. On the views put forward in Chapter III. the Auxiliary Artillery will be restricted to the manning of the heavy guns in fixed emplacements, and to them therefore only does the system explained in the drill-book apply in its entirety. They must be prepared to work these guns when wanted, and will not be required to man any others. Each company then need be trained only in the method of fighting those guns to which it is allotted, and the system of training will follow that already described for the special training of Garrison Companies. As the time, and opportunity of training these forces is considerably less than that available for the regular forces, this restriction of necessary duties is a distinct advantage, and the limits of the training required should admit of efficiency in the comparatively little that is asked for.

The Militia.

In the Militia the Officers have as a rule to go through a regular course of instruction, and each unit is regularly called out annually for its month's training, so that with systematic training, and proper insistence that Officers attain the required standard, the Militia Artillery should with the assistance of their Adjutants, and Gunnery Instructors, be qualified to perform the duties that are demanded of them, especially if, as has been done lately, they are sent for their annual training to the Fortresses which in time of war they are called upon to man.

Volunteers.

But the Volunteers do not enjoy the same advantages. Though it may be possible in the limited time at disposal for instruction, to train the gun detachments to the useful handling of the guns to which they may be allotted, the present instruction of Volunteer Officers is not altogether satisfactory. They are as a rule eager and willing to learn, but the opportunities for satisfactory instruction are not as frequent as could be desired. On the distribution advocated in Chapter III., Volunteer Officers may be required to act as Fire Commanders, or in any of the grades subordinate to this appointment, they should therefore be thoroughly trained in the duties of all commands from that of Fire Commander down to Gun Group Commander. As a rule many of these Officers cannot find time to attend regular courses of instruction, they are not below the average standard of intelligence, and would soon pick up their duties if opportunities were given for learning them. To each Volunteer Brigade is allotted an Adjutant, who is an Officer Royal Artillery, and it should be part of his duties to hold, at least at Head Quarters of the Brigade, evening, or afternoon Classes as most convenient, for the instruction of Officers in the duties relating to Coast Defence. He should, moreover, pay visits to outlying Companies from time to time with a view to giving similar instruction to the Officers of the Company, and where such outlying Companies are found, a Gunnery-Instructor, who should be a Volunteer Officer who has been through a special course, and obtained a Certificate, should be appointed to assist in the proper training of all ranks.

Combined Training.

The general sketch given above of the kind of training required for the separate units of an Artillery Garrison leads us to the question of how the combined training together of these units can best be carried

out. One of the points already advocated is that the training should be on the basis of making the Battery Command the unit. If this is done, so far as the men are concerned, when they are trained to their duties in this command, they are trained to all that is required of them. Such Commands work much more independently of one another in Garrison Artillery work than in other Military operations, and their combined action consists merely in the direction by one mind of their independent actions to one definite object. The grouping of Battery Commands under a Fire Commander, so far as it adds to, or alters the duties of such Commands, affects only the Officers. If the men know their duties connected with the Battery Command, and can work their guns efficiently they will do so equally well, whether their guns form a separate command, or are being fought under the direction of a superior officer as parts of a larger Command; therefore to train the Garrison to work the "Chain of Command" smoothly and efficiently, all that is required is to train the various officers to take up rapidly and intelligently their positions, and duties, when the chain extends from the Section Commander down to the Gun Group Commander. It is only to this extent then that the training together of the various units of the Artillery garrison is necessary or desirable.

As far as the R.A. are concerned opportunities can generally be found in the ordinary course of training for instruction in these duties. Royal Artillery.

Militia officers too have an opportunity of being exercised in the duties and working of a Fire Command when called out for their training, particularly if this takes place as it should whenever possible at the Forts which they will be called upon to man in time of war. Militia.

Volunteer Officers are generally placed at a great disadvantage in this respect for as has been pointed out their instruction is not as complete as it should be, and often they have but few opportunities of becoming practically acquainted with their duties. It might however surely be arranged that once or twice a year such portions of the Artillery Garrison of a Home Fortress as is represented by the R.A. Companies therein stationed, and the Volunteers available at short notice should be brought together to work the different Forts to which they are allotted under the conditions most resembling Service conditions: but for this to be of practical benefit such an assembling should include practice from all the guns manned wherever possible, even if only two or three rounds are fired from each gun. This means an expenditure of ammunition and consequent expense for which it is always difficult to obtain sanction. But such a combined fire-action might be arranged, if the present allotment of ammunition to Station practice were utilized for this purpose. At present it can hardly be claimed that this ammunition is used to the best purposes, indeed it seems often to be fired away simply because it has to be expended, and it would therefore surely be much better to utilize it to test to some extent the value of the chain of command in each fortress, and to discover where the weak links lie. Moreover, on the distribution of the Garrison advocated here, this ammunition, or at any rate as much of it as belongs to the guns that are to be manned by the Volunteers, should Volunteers.

be expended by them. Such combined practice where feasible would be of great benefit to the Volunteers, and invaluable to the Commanders of the higher units as giving them an opportunity of practically testing their Commands.

It may perhaps appear somewhat strange, that when asked what is the most suitable system of training together the Garrison Artillery forces, we reply that the best system seems to be not to train these forces together, but to train each unit separately; and yet the considerations given above point to this. If we emphasise the intention already expressed that the Company drill and training should be wherever possible with the very guns that they will be called upon to man in time of war, and that this is intended to apply as much to the Militia and Volunteers as to the Royal Artillery I think it will be seen that the work of the Battery Commands should be satisfactorily and efficiently carried out, and that this is really all that is required from the ordinary rank and file. The kind of co-operative action required to work the units of a Fire Command together does not necessitate more than individual action of the units guided by one master mind. To work a gun all the men in the detachment must work in unison, to work a group of guns, the gun detachments must work in combination, while to fight a Battery Command the guns must be worked not only in combination but in harmony. But where several Battery Commands are fought under a Fire Commander, each Battery Command works independently though it may be in support of the others: each has its particular portion of the work to be done allotted to it, and the actual doing of this depends on its own training and efficiency, not on previous training with the other commands, it is less concerted than combined action. Where then is the necessity for training these forces together, beyond that already mentioned of affording the officers an opportunity of learning their duties and positions? but this can be done without elaborating a system of training which is not required and which would be difficult to arrange so as to be of practical value. Under the system here advocated no difficulty should be experienced in training each unit at the times, and places most convenient to it; no unit will have to wait in order to complete or perfect its training till a time or place suitable or convenient to other units can be arranged. This is certainly a practical advantage gained.

Summary and
Conclusion.

The adoption of some such system of training as here advocated would entail but little alteration in the existing methods of drill and organisation. In fact the only alteration required is the recognition of the use and importance of the lighter guns of Coast Fortress Armament in carrying out the work of defence that will most usually be necessary, and the consequent desirability of having the elementary system of training based on their requirements: the need for a further special training is due to the multiform character of Garrison Artillery duties. And here it is curious to note how easily the proper signification of a term may be lost, and how much there really is in a name if the meaning it connotes is not allowed to drop out of sight. We call that portion of the Royal Regiment of Artillery which has no mounted

duties to perform "Garrison Artillery," and we do so presumably to denote in a general way what its duties are. If we enquire what is meant by the term Garrison Artillery we must perhaps admit that it necessarily has a somewhat indefinite meaning; but if it is difficult to attach an exact meaning to this term, it is not less easy to predicate of it, that it cannot and does not mean merely "Coast Artillery," that is Artillery employed on sea fronts, whose sole business is the attack of war vessels; and yet with the exception of a few Companies which are detailed as Siege train or Heavy batteries, the whole of the so-called Garrison Artillery is at present trained only to fight guns on sea fronts, and thus becomes a Coast Artillery and ceases to be a Garrison Artillery. The word Garrison certainly connotes a Fortress and with it the idea of general duties varying with the locality and importance of the Fortress. But the duties of any Fortress including Coast Fortresses are not confined to defeating an attack by ships' guns and yet *Garrison Artillery Drill*, Vol. I., is devoted almost entirely to this one object. This is either a confusion of terms or a misapprehension of their meaning, if the former let us call our Companies *Coast Artillery Companies* if the latter let us train our Companies so that they may be able to perform Garrison duties. Garrison is the term we use, and ought to keep to, but we must understand that it is synonymous with Fortress, and connotes certain general duties that are necessarily indefinite, and therefore by implication denies the existence of only special duties.

It has been my endeavour in this essay by enumerating the different forms of attacks on Coast Fortresses, and examining the probability of their occurrence, under various circumstances, to ascertain what the duties of Artillery Garrisons in war time are likely to be, and hence to formulate a system of training that will be suitable to the requirements of all cases. This examination has led to the following conclusions.

Conclusion

1. That the attack by war ships on Coast Fortresses is by no means the most general, or the most important form of attack to be expected.

2. That therefore our present system of training which deals almost exclusively with this aspect of war, is a too particular one, and requires generalisation and simplification to meet the other more frequent, and important needs of Coast Defence.

3. That in modifying this system of training care should be had to the requirements of the different units composing the Artillery Garrison, their training being in accordance with the duties that are expected from them, and that therefore R.A. Companies whose duties at different times cannot be particularly defined, must receive a different training from that sufficient for the Auxiliary Artillery whose duties being always the same are clearly marked and quite definite.

4. That the training for the R.A. should be, (a) *General* in the application of the broad principles that underly the fighting of all guns. (b) *Special* in the particular adaptation of these principles to the working of those guns which each Company may at the time being be called upon to fight.

5. That the training for the Auxiliary Artillery need only be with

reference to those guns to which each Company is allotted in the scheme of defence.

6. That the training of all should be carried out on the basis of the Battery Command being the tactical unit.

7. This leads us to the final conclusion that it is not necessary to train the N.C.O's. and men of different units together in order to obtain efficient work, but that it is very desirable that all officers should have frequent opportunities of practically carrying out the duties connected with the tactical working as a whole, of the command to which they belong.

I have endeavoured as far as possible to avoid any suggestions of a radical or revolutionary nature, these seldom meet with much consideration, are generally of theoretical rather than practical value, and indeed as regards this question are in no way necessary. As in my opinion our system of Coast Defence has hitherto inclined altogether too much in one direction, so I am anxious now that the swing of the pendulum should not carry us too far in the opposite direction, but that our progress in the future should follow the sounder and more even course which is indicated by the motto of this essay—

“IN MEDIO TUTISSIMUS IBIS.”

THE TRAINING TOGETHER IN PEACE TIME THE GARRISON ARTILLERY FORCES OF THE EMPIRE, INCLUDING REGULAR, MILITIA, VOLUNTEER, & COLONIAL ARTILLERY.

BY

LIEUT.-COLONEL R. F. WILLIAMS, R.A.

“PRO ARIS ET FOCIS.”

COMMENDED ESSAY, 1895.

BEFORE considering in detail the question of the training together of the Regular and Auxiliary Artillery belonging to the garrison of a Coast Fortress it is necessary to determine how often

- (1) The whole of the Artillery Garrison of the fortress,
 - (2) The Corps constituting each group of Batteries under a Fire Commander,
 - (3) Those manning the guns of each separate Battery,
- should be assembled respectively; and further to ascertain how far this would be practicable in each case.

(1) A rehearsal by the whole of the Artillery of a fortress of its part in war, as nearly as such could be carried out in time of peace, would be valuable principally as a test of the arrangements for mobilization, of those for transport and supply and for the accommodation of the Garrisons as well as for medical and sanitary purposes, &c., and of organization generally. Such occasions would also doubtless be seized upon as opportunities for operations on a large scale in conjunction with the other arms and with the Navy when the defence of the fortress would be regarded as a whole. Their chief value would in fact lie in the experience which they would afford to Officers in the higher commands and on the Staff. For the rest, equal, if not greater benefit would probably be derived from assemblies on a smaller scale.

It might be sufficient to keep pace with the changes in armament and with the progress in Coast Artillery tactics if the whole of the Artillery of a fortress were mobilized once in every 5 years. This period would moreover seem to be a suitable one in being in most cases that of the tenure of command and of posts on the Staff, so that each of the Officers filling these positions would, if this term were fixed upon, be afforded an opportunity of gaining experience at an occasion of a mobilization on this large scale. The difficulty indeed of arranging for the simultaneous training of so many Corps as constitute the Artillery garrison of a large fortress, and the expense of

bringing the more distant ones there, would probably be prohibitive of a more frequent recurrence than this of such large assemblies.

Whether, however, at such intervals as those mentioned, or, if that were found to be impracticable, at longer ones, it is certain that the complete manning of the guns of a fortress is periodically necessary if the arrangements for the defence are to be tested, and their weak points detected, before, and not when, an enemy's ships appear in front of the forts.

(2) The group of forts under a Fire Commander constitutes the largest fighting unit of a fortress; and he would require much more frequent opportunities of exercising his command than would be allowed by the occasional assemblies of the whole of the Artillery of the fortress. It is true that a Fire Commander's duties are to a great extent of a preparatory nature, and that during an engagement his part would as a rule be confined to the earlier stages, when the enemy was still at a long range: but although his action would be thus limited, the subsequent conduct of the engagement by the Battery Commanders would entirely depend on it. The rapid choice of an objective, the transmission of the necessary orders to the Battery Commanders, and their instant action on them, and finally the decision as to the right moment for handing over the control of fire to the Battery Commanders are all matters which require experience on the part of all concerned, the want of which might entail serious consequences in action. Skeleton drill could no doubt be profitably carried out in the absence of the bulk of the garrisons of the forts; but, for a rehearsal to be at all satisfactory, it is necessary that not only the Fire and Battery Commanders, but all those occupying posts of any importance should be the identical persons who would fill them in time of war; and this condition could not of course be fulfilled unless the whole of the Corps included in the Fire Command were present. No arrangement indeed could be considered wholly satisfactory which did not provide for the Fire Commanders of the more important groups of forts at all events having an opportunity of exercising their commands every year. There should be no difficulty in carrying this out, as the most important guns would naturally be manned by the men closest at hand, that is to say by the Regulars stationed in the fortress, and by the local Auxiliaries. As it would be out of the question for Militia Artillery Regiments at a distance, which might be allotted to the fortress, to train there every year, they would doubtless be told off to the forts of lesser importance. It would probably be sufficient, especially as the guns in these latter forts would be likely to be of a simple nature, if they were manned every 2nd or 3rd year. The Fire Commanders of the groups of forts of minor importance would therefore only be able to exercise their batteries together at these longer intervals, though perhaps a partial manning could be effected oftener.

(3) Want of experience on the part of a Fire Commander in working together the Batteries under him might be partially remedied by his allowing independent action to the Battery Commanders under

him, but there is no remedy for insufficient practice in the manning of the individual Battery, which could only in action result in a reversion to the old order of things before such terms as "Fire direction," "Fire control" and "Fire discipline" had been heard of. The Battery is indeed the real fighting unit of a Coast Fortress, and the necessity for the correction of any imperfections in the machinery for fighting it is of such vital importance that it is not an exaggeration to say that it cannot be manned by its garrison too often. Unfortunately the few days that the Volunteers can spare for camp in each year do not admit of their Batteries being manned with such frequency as is desirable: and even in the case of the local Militia Regiments, which carry out their training at the fortress every year, there is so much else to be done during the month that hardly enough time can be devoted to this very important part of it. All that can be done therefore is to make the most of the time available in each case, to ensure which two things are necessary; first, that a judicious programme of work should be arranged; and secondly, that the preparatory training carried out beforehand should have been as complete as circumstances may have permitted, so that when the course commences no time need be wasted in elementary details, and thus that the fullest possible benefit may be derived from it.

Before a programme for such a course can be drawn up it is necessary to know (1) how the Artillery of the 3 branches (Regulars, Militia, and Volunteers) are to be distributed; and (2) also, in the case of the Auxiliaries, whether they are to be prepared to man the Batteries allotted to them independently of any assistance from the Regulars; or, if not, to what extent this assistance is required.

(1) The advantages of associating Corps with particular localities are well known; and, in order to encourage the various Artillery Corps of a garrison to identify themselves with the Batteries which they have been told off to man, every endeavour should be made to avoid shifting them to other localities, even when changes in armament or in the scheme of defence take place.

As to the way in which they should be distributed, the Regulars and the local auxiliaries would, as already stated, as a matter of course man the most important forts, as being the nearest at hand in case of sudden attack. The local auxiliaries too would have had more opportunities than those at a distance of drilling with the guns of the fortress: and, if another reason were required for this method of distribution, one not altogether to be disregarded, though perhaps to some extent a sentimental one, is to be found in the fact that local corps would be those most deeply interested in the defence of their own port, and that to them therefore would seem rightly to belong both the duty and privilege of occupying the post of danger. It would be a matter for decision according to circumstances whether in these more important forts the guns to be manned by the Regulars would be those in the most important positions or any which might be too complicated in themselves or their mountings for the Auxiliary Artillery. The forts to be manned by the more distant Corps would

be those probably in the inner line of defence and on the land front. It would fall to them also to man the movable armament, for which they would be able to prepare themselves at their own stations if provided with similar guns there.

In detailing garrisons to the different forts the necessity for providing for reliefs should not be lost sight of. A detail which only allowed for one relief, though sufficient for peace operations, would of course break down at once in time of war. If then the strength of the Artillery of a fortress were insufficient to allow of reliefs being provided, some of the guns would have to be left unmanned. Either each work might, in such a case, be only partially manned, or the most important ones might be fully manned, the others being neglected altogether. It would depend on circumstances which would be the best course. As a rule it would probably be best to fully man the more important forts. As a Corps would furnish its own reliefs, on the principal of avoiding the mixture of units, it would be necessary that not more guns should be allotted to it than it was capable, when at its full strength, of providing reliefs for.

The quick-firing gun of small calibre, a considerable number of which are now being introduced into the armament of most Coast fortresses, seem to be marked out as specially suitable for the Volunteer Artillery. Except in the matter of laying, the service of these guns is so simple as to be easily carried out even by those members of a Corps who are often unable to attend drill. The ammunition is moreover cheap in comparison with that of heavy guns, thus allowing of a considerable amount of practice, which is always an attraction to Volunteers, whilst the drill would be reduced to a minimum. The post of layer of one of these guns, on the other hand, would not be so easily filled, as it would require a man of exceptional skill and in constant practice to be able at once, and almost instinctively to judge the range of a small target moving at the highest rate of speed and to lay correctly on it. There would be keen competition amongst the more active members of a Corps for these posts, which would no doubt result eventually in the production of experts, as has been the case in rifle-shooting. An expert is indeed required as the layer of a quick-firing gun, and he should be allowed enough ammunition for practice. It is hardly overstating the case to say that a man placed at hap-hazard in this position at the last moment would have no better chance of hitting an enemy's torpedo-boat moving at 20 knots than a novice in the use of a rifle would have of hitting a running deer. The companies to man these guns should be selected from those of outlying stations, and unable therefore to drill throughout the year at the guns of the fortress. All that would be necessary would be to provide each of such companies at their own stations with a quick-firing gun of small calibre and with enough ammunition to afford practice to the requisite number of layers. These companies would no longer feel themselves at a disadvantage as compared with those at Head-Quarters, for on their arrival at the fortress they would be prepared at once to take their places and to play an important part in its defence.

It is a question whether in the case of the Auxiliaries, and especially in that of the Volunteers, whose course of training is so short, the principle of localization should not be carried a step further by assigning groups of guns to particular companies. This would be decided by the Commanding Officer according to circumstances. If some of his companies had greater facilities for drilling at their station than others, the more important groups should no doubt be handed over to them. When too the guns varied in type, it would certainly seem best to assign them permanently to particular companies. It would be a mistake to attempt to go still further in this direction and to assign to every man a particular place, except of course in special cases, as such an arrangement would make no allowance for casualties or unforeseen circumstances. Every man should be trained to take any place in his gun detachment or ammunition detail.

(2) Though it has been found necessary to create a permanent staff of Specialists for the performance of certain special duties in each Battery, it does not follow that in the programme for the training of a Corps manning a Battery these special duties may be entirely neglected, for it should not be forgotten that the District Establishment only provides for one relief of such Specialists, and that it makes no allowance for casualties amongst them. If no provision were made for this, what would probably happen in action would be that, to supply the want, Specialists would be withdrawn from the permanent Staffs of other Batteries which were less immediately threatened. This would be a most objectionable plan, as the permanent staff of a battery is the nucleus of its Garrison and should therefore never be removed from it. Clearly then it would fall on the Corps itself to provide for these contingencies; and it is necessary therefore that it should prepare itself in time of peace to do so.

The plan that suggests itself is that from amongst the N.C. Officers and trained gunners of the Corps "Understudies" should be selected for each post in the permanent staff, who during the training should be employed exclusively in practising their own special work. Selected as they would be from amongst the trained men, they would at any time be ready to return to their places at the guns if required, all that would be needed being an occasional re-drilling to enable them to learn any changes in drill.

It is true of course that these special duties cannot be adequately performed by men who can only give them an intermittent attention, and that these "understudies" could not be expected to reach the perfection which is attainable only by long and constant practice. As position-finding operators especially they would no doubt fall short of the requisite standard; but if the same men were trained at the work every year, they might hope in time to become competent operators. There is no reason at all events why the Auxiliary Artillery should not be able to provide itself with efficient Depression Range-finding operators. As regards the duties now performed by Gunners of the District Establishment, a Corps manning the same work year by year

would have no difficulty in providing men with a sufficient knowledge of the locality and of the duties to act as Magazine and Lamp men. Even the Armament artificers might find useful assistants amongst the artizans in the ranks of the Corps. It must be admitted however that it would be hard to replace the Master-Gunner or the R.A. Storeman. It should be the aim of a Corps to make itself independent in every particular, so as to be prepared in case it should be thrown on its own resources at any time. The necessity for this will be better realized by the auxiliaries if the principle of localization is rigidly adhered to. A corps if assured that certain Batteries are permanently handed over to its charge, will not be satisfied till it has mastered every detail connected with their defence.

In accordance with what has been said above a Corps should be prepared to provide Battery Commanders for the Batteries manned by it. The introduction of a Battery Commander from elsewhere would be contrary to the recognized rule that men should be commanded by their own Officers. In the ordinary course therefore the Senior Officer of that portion of a Corps manning a Battery would be its Battery Commander. The senior officers of the Auxiliary Artillery have of late years received instruction in the duties of a Battery Commander, and many of them have had opportunities of acting as such; and no doubt the number of qualified Battery Commanders amongst them will increase as time goes on. So much depends on the Battery Commander that it is imperative that he should be thoroughly up to his work. Now, although the Officers of the Auxiliary Artillery avail themselves gladly as a rule of the opportunities afforded them of learning their work, it must be admitted that there is a considerable minority whose attendance at drill and at the periodical trainings is irregular, and whom it would be imprudent to place, at all events unchecked, in these responsible positions. Even if such a course were desirable, the number of Senior Officers of the Regular Artillery in a fortress would as a rule be insufficient to allow of their superseding such Officers as Battery Commanders. Such cases as this might be provided for, and at the same time the objectionable expedient avoided of placing a Senior Officer of Auxiliaries under one junior to him of the Regulars, if a Fire Commander were empowered to attach to a Battery Commander under such circumstances a competent Officer of the Regular Artillery, though possibly of junior rank, as adviser, fully impressing on the former at the same time the grave responsibility he would incur in declining without sufficient grounds to be guided by the advice of such Officer.

The post of Fire Commander would also occasionally fall to an Officer of Auxiliary Artillery, many of whom would doubtless fill it efficiently, if they had had the opportunities of learning and practising its duties. Inexperienced Officers would however require, and to a still greater extent of course, similar assistance to that alluded to above in the case of the Battery Commander.

Whatever plan may be adopted, the fact should not at all events be overlooked that by far the greater number of guns in a Home fortress

would be manned by Auxiliary Artillery, the Senior Officers of which will naturally become the Fire and Battery Commanders, as they cannot well be set aside in favour of junior Officers, though possibly of greater experience, of the Regular Artillery. The question is no doubt a somewhat invidious one, but it is not one that can be safely postponed for decision till the last moment. Fortunately the difficulty is one which is likely to decrease as the Auxiliary Officers become better acquainted with Coast Defence work, and qualify themselves to act independently in the highest positions which they may be called upon to fill.

INSTRUCTORS.

The instruction of the Auxiliaries during their training would be carried out of course by the Regular Artillery. In the case of a Corps new to Coast Defence work the instructional staff would necessarily be large. The Superintending Officer would require 2 or 3 Officers of Regulars under him as Assistants and some N.C. Officers in addition to those of the Permanent Staff of the Corps, as at this stage thorough supervision would be required over every portion of the work. At first also a few Gunners would be required from the regulars to take some of the more difficult duties until these were thoroughly understood by the men of the Corps. As time went on however the Staff of instructors should be gradually diminished, the Officers and N.C. Officers of the Corps taking up the work of instruction themselves. It is indeed of the highest importance that they should qualify themselves to do this at the earliest possible moment, and should not be content to remain under tutelage year after year, for it cannot be expected that the rank and file will have that confidence, which it is essential to discipline that they should have, in Officers and N.C. Officers who never take their proper places as instructors of their men.

The principle then on which the instruction should be carried out by the instructors of the Regular Artillery is that, although in the first instance every assistance should be given, support should be gradually withdrawn till eventually their intervention would be confined to the framing of the programme, the communication of any new points in drill or in Coast defence tactics, and beyond this merely to supervision. It is important that this last should always be maintained to ensure the work being done in conformity with the recognized system.

PROGRAMME OF WORK.

The principle on which the distribution of the Artillery corps of a fortress should be made being determined and it being understood what is expected of them in manning the Batteries to which they are allotted, we are now in a better position to draw up a programme for a course of training to fit them successively to man a Battery, to take part in the manning of the forts under the Fire Commander and finally in the general manning of the whole fortress.

Time available.—As the Militia training lasts for 28 days, whereas the Volunteers cannot be depended upon to be able to come out for more than a week, it is evident that when Corps from these two

branches form part of the same "Fire Command" the week of the Volunteer training must be made to coincide with the last week of that of the Militia if the Fire Commander is to have an opportunity of working them together at the end of their training.

During the first three weeks the Militia would be engaged in preliminary drills, which in the case of the Volunteers would have been going on during the whole year. It is necessary in the first place to see on how many days the Volunteers are actually available for work; how many of those days would be taken up by them in preparatory drills to bring them up to the point of manning a Battery efficiently; and finally how much time is left to the Fire Commander in which to exercise his batteries together. 3 days must be deducted on account of Sunday and of the days of arrival and departure, for although some little work might be done on the 2 latter days, they cannot be reckoned on with certainty; so that there remain only 4 days for work. As has been said, drills would have been carried on throughout the year, but only those Companies in the neighbourhood of the fortress would have been able to drill in their own Batteries. 2 days would therefore seem to be the minimum for this preparatory drill in the case of a Volunteer Corps, which would leave the remaining 2 days at the disposal of the Fire Commander. The time being so limited, it is important that none of it should be diverted from its intended purpose, that of instruction in Coast Defence work; and on this ground it may be urged that any inspections should be confined to the Corps being seen at work during its course of instruction, any interruption to which is strongly to be deprecated.

Regulars.—As regards preparatory training on the part of the Regulars, who would of course take part in the combined operations at the end, it might be taken for granted that the Permanent Staff would be in constant practice and therefore always in a state of readiness. The same might perhaps be assumed in the case of the Companies of the Regular Artillery if it were not for the fact that there is always in their ranks in these days of short service a considerable number of recruits. On this account therefore it would be as well if the annual courses of these Companies were completed before the time for working the 3 branches together. This of course is not always practicable, especially if the Auxiliaries come out early in the season. It might however possibly be arranged that even under these circumstances the recruits might have had sufficient drill to enable them to take their places in the gun detachments. As the Auxiliary Artillery naturally model themselves on the Regulars, no effort should be spared to bring the drill of the latter up to the highest pitch of precision and smartness.

Militia.—During the 28 days that the Militia are out many other things besides Coast Defence have to be attended to. In the first place the Officer Commanding requires a day or two to enable him to get his Regiment into shape. The inspection by the Officer Commanding Militia and Volunteer Artillery takes place during the training, if not other inspections also. Time for preparation for these, including

a certain amount of Battalion drill, must be allowed to give the Regiment a chance of making a creditable turn-out. Certainly minor drills, such as physical training, marching and carbine drills can be carried out at early morning parades, so as not to interfere with the Coast Defence course. Further deductions must be made for Sundays, Saturday half-holidays and Camp fatigues: and finally, at least one whole day in addition to that of departure is required by the Officer Commanding preparatory to breaking up Camp.

Summing up the days to be deducted on these accounts :

Regiment at disposal of Officer Commanding at beginning of training	2 days
Regiment at disposal of Officer Commanding at end of training	2 "
Inspection and preparation for it	3 "
Sundays and Saturday half-holidays	6 "
Camp fatigues &c.	1 "
Total.....	<u>14 days</u>

This leaves 14 days available for a Coast Defence course; and further deducting 2 days for the combined manning of the forts at the end under the Fire Commander, 12 days remain for training the regiment in all the work connected with the manning of a Battery, including practice.

As weather is so uncertain a factor, the programme must be drawn up on the assumption of fine weather, or, what is practically the same thing, of the work being in casemates. In the event of bad weather and open Batteries the programme would of course have to be condensed accordingly.

In addition to an early morning parade of about three-quarters of an hour under the Commanding Officer of the Regiment 5 hours a day would be as much as could profitably be devoted to the course. With longer hours interest in the work would begin to flag.

Each morning all ranks should fall in on the manning parade, and these opportunities should be made use of for publishing any important orders or for imparting information that is required to be generally known. At this time on the first morning the plan of the fort should be explained, especially as regards the locality of the different groups of guns, the shell and cartridges and R.A. Stores. In subsequent years this would only apply to new-comers. Extracts from the Magazine Regulations should be read out, and any special local orders. The object of each day's drill should be explained on parade beforehand. Before practice the "General Idea" should be made known, orders relating to the practice read, as well as the precautions to be taken. To prevent the possibility of mistakes the bugle sounds most commonly used at practice should be sounded before the parade and made known. On the morning following the practice the criticisms on it should be published.

After these preliminaries on each day drills and lectures would be commenced, the latter for Officers and a few of the senior N.C. Officers. At first, in the absence of the Officers attending the lectures, the drill would be carried out under the N.C. Officers of the Permanent Staff of the Corps assisted by others lent by the Regulars, the whole being under the supervision of Officers of the Regular Artillery.

It will facilitate explanation of the following programme of drills and lectures if the different stages of the former are lettered *A, B, C, D*, and those of the latter *a, b, c*.

An endeavour has been made so to arrange the courses of drills and lectures that the senior N.C. officers and the officers should, beginning with the juniors, successively leave the lectures to join the drill at the earliest possible moment.

The programme does not enter into much detail, as it is thought that the absence of this will make it more generally applicable.

DRILLS.

- A* { Single gun-drill, with such explanations of construction of gun
and mounting as is practically necessary.
Similar instruction in ammunition.
Service of ammunition, and its preparation.
- B* Laying of every description.
- C* Drill by groups.
- D* Manning the Battery.

LECTURES.

- a* { Extracts from Fort Book.
Range-finding—Depression Range-finding or Position-finding, or
both as the case might be.
Duties of Gun Group Officer.
Duties of Amunition Officer
- b* Duties of Battery Commander.
- c* Duties of Fire Commander.

It is proposed that of the 12 days available *A* stage of drill should occupy 3, *B* stage 2, *C* stage 3, and *D* stage 4 (including 1 or perhaps 2 days' practice).

All the Officers and senior N.C. Officers would attend stage (*a*) of the lectures, which would be carried on simultaneously with *A* drills. On the termination of the former the subalterns and senior N.C. Officers would fall in with their men for stage *B* of drill. Field Officers and Captains would attend lectures (*b*), which would be simultaneous with *B* drills, the Captains joining their groups for *C* stage of drill. The final stage (*c*) of lectures would be for Field Officers only, who would in their turn fall in for drill in stage *D*, so that all ranks would be in their proper places for the full manning of the Battery.

It has been assumed above that all Officers would be acquainted with stage *A* of drills, as even the last joined subalterns would probably

have been through a preliminary course with the Regular Artillery. If however there were any Officers of whom this could not be said they would have to forego the lectures during their first year and to attend drill exclusively.

It has been thought best to include the senior N.C. Officers with the Officers for the earlier lectures, as in action they would be liable at any time to be called upon to take the place of Officers, and further because it is necessary that they should be acquainted with the principles of Range-finding.

The above programme provides for all Officers being instructed in the duties of any post which they would be likely to fill, as it could only be very exceptionally that a Lieutenant would have to act as Battery Commander, or a Captain as Fire Commander.

No mention has been made of the Range Group Officer, as this post would have to be filled by an Officer of the Regular Artillery, unless one of the Corps manning the Battery had qualified himself for it by going through a special course.

The duties for which the Gunners lent by the Regulars to a Militia Regiment would be wanted would be not only those of specialists properly so called, but also others of a simpler nature, but such as the Regiment could not at first undertake itself. Position-finding dial readers, Depression Range-finding drum-readers and telephonists come under this head. When stage *B* of drill had been completed men should be selected to learn the work of each of these posts from the Regulars acting in them. When they undertook the work themselves supervision would be exercised over them, to prevent mistakes, till they had shewn themselves to be fully competent, and then assistance entirely withdrawn. Although these duties are easily learnt, the posts are ones of great responsibility, as any mistakes made by the men filling them would be likely to have serious consequences. It would be necessary therefore to select only intelligent and thoroughly reliable men; and such men having been once found and taught, it would obviously be the best plan to employ them permanently in their respective capacities.

If the men selected as "understudies" to the specialists spoken of before were kept exclusively at their special work, a Militia Regiment should be in a position to furnish its own Depression Range-finding operators during its 2nd year of Coast Defence training. This would of course be out of the question in the case of the "understudies" to the Position-finding operators; but they would improve each year till eventually they would become specialists themselves.

Although communication in Coast fortresses is generally by telephone or speaking tube, signalling is occasionally called for, and for practice it is always wanted. A Militia Regiment therefore cannot consider itself to be thoroughly equipped unless it has its complement of Signallers. Instructors would of course at first be provided by the Regulars till the Regiment was able to carry out its own instruction. It is possible too that amongst the many old soldiers in a Militia Regi-

ment some might be found with a knowledge of signalling.

VOLUNTEERS.

The Volunteers being only able to count on 4 whole working days during their week of training, and the last 2 of these being required by the Fire Commander, there remain only 2 days in which to bring themselves up to the point reached by the Militia on the completion of the programme sketched above. For this to be possible a great part of the programme, that is to say stages *A* and *B* of it, must have been completed beforehand. Facilities for doing so would no doubt have been given to companies quartered near the fortress, but it could hardly be expected of the more distant ones, which would as a rule be provided at their stations with nothing more modern, to carry out their preparatory training, than 64-prs. (or possibly S.B. guns) on standing carriages. The time would be more profitably spent indeed by these latter companies if the whole week were devoted to the above mentioned programme, at all events during the first year of their training at the fortress.

For the Companies more fortunately situated for carrying out their preparatory drill there would be one day for working by groups and one day for manning the Battery before they would be required by the Fire Commander.

It is difficult to see how any practice can be included in the programme without sacrificing some essential part of it, in the case of a Corps new to the work. Subsequently no doubt, when it had made sufficient progress, practice would be the best shape in which instruction in the manning of a Battery could be given.

As the Officers would be required on parade with their men, they could not receive separate instruction, as in the case of the Militia Officers, unless extra time were given to it. The best plan would seem to be for them to fall in half or three-quarters of an hour before their men on each occasion for a lecture to be delivered to them on the work to be done during that parade.

The same course should be pursued by the Volunteers as by the Militia to provide assistants to specialists and to make the Corps independent in all respects as far as possible. As it is now intended to furnish each Volunteer Corps with a Depression Range-finding instrument for instructional purposes, operators can be trained during the year, if a knowledge of the instrument is made a compulsory qualification for appointment to the Permanent Staff. But little progress could be made in a week in Position-finding; but perhaps men might be found in a Volunteer Corps with sufficient leisure, and at the same time with an aptitude for the work, who would be willing to give the necessary time for going through a special course of Position-finding for the sake of supplying this want in their Corps.

If some of the N.C. Officers of the Permanent Staff understood signalling, there would be no difficulty in a Brigade of Volunteer Artillery providing itself with the requisite number of signallers, who

could be trained at their own stations. This again might be considered as a recommendation in a candidate for the Permanent Staff.

It must not be forgotten that places will have to be found in time of war for a certain number of Volunteers who have been irregular in their attendance at drill, but who will no doubt join the ranks then. It is hardly necessary to say that they should be placed in positions of the least responsibility. There are places which require little or no knowledge of drill (such as those of Nos. manning winches, orderlies, &c.), by occupying which even an inefficient man may become of value, as thereby freeing an efficient Gunner for more important duties.

ACCOMMODATION.

A course of training for the Coast Artillery would be incomplete which took no notice of the accommodation of the garrisons of the different Batteries, whether in barracks, camp or casemates, the arrangements for which are indissolubly connected with those for fighting. The Volunteers during the whole of their week of training, and the Militia during the last week of theirs, should be accommodated exactly as they would be in time of war, the Regulars of course similarly occupying the forts manned by them. This would be with the double object of testing the arrangements and of affording experience to the troops. For lessons of real practical value to be derived from these rehearsals the conditions should be made to resemble in every detail as far as possible those of an occupation in time of war; and a point should be made of making every garrison carry out its camp duties without any assistance except in the way of instruction. Every Corps should in the first instance be thoroughly instructed in such matters as the laying out of camps, sanitary arrangements, the system of cooking, the stowing of kits, hammocks, provisions, &c., the arrangements for the water supply, and generally in the establishment of a good system of interior economy; and careful supervision should be exercised over these matters afterwards. Too much stress cannot be laid on the importance of this part of the training, as in time of war the efficiency of the soldier depends in no small measure on the arrangements for his health and comfort.

THE MANNING OF THE "FIRE COMMAND."

The point has now been reached when, the separate manning of each Battery having been thoroughly rehearsed, the Fire Commander works his Batteries together. The object of his programme should be to practise himself in "Fire-direction," to initiate his Battery Commanders in his way of working, to test the chain of command from himself down to the Gun Captains, and to test the communications. It would add much to the reality of the operations if the co-operation of the Navy could be obtained; and this would moreover enable the Fire Commander to practise one of his most important functions, viz: the identification of the various types of war-vessels from his post of vantage whilst they were still out of range, and the passing of this information to the Battery Commanders in sufficient time to allow them to prepare for their reception, and it would also afford practice to the

Battery Commanders themselves in the selection of projectiles suitable for different objectives and in choosing the portion to be aimed at. Except for these purposes steam-launches would be fairly satisfactory substitutes.

Nothing would be learnt from these operations unless the results were tested, that is to say unless it could be ascertained what action was taken consequent on the orders issued by the Fire Commander, and whether there was any unnecessary delay in their execution. Blank ammunition will to some extent shew this, but not sufficiently. To satisfy himself on this point the Fire Commander would require officers as assistants on the gun-floor of each Battery who would record the action taken there on the receipt of each order and would note the time of its receipt, a comparison of watches with that of the Fire Commander having of course been made beforehand. In this way it might be possible to trace the point in the chain of command at which any failure had occurred either in interpreting correctly or in carrying out the Fire Commander's order, or where there had been any unnecessary delay.

Not the least important result of this drill would be the opportunity it would give the Fire Commander of gauging the capacity of his Battery Commanders, and them too of becoming acquainted with his way of working; a further consequence again of this better mutual understanding being probably a reduction in the number of orders which the Fire Commander would find it necessary to give, as also in the chance of their being misunderstood. The Fire Commander's programme ought certainly to include a manning of the Batteries by night both to give practice in laying with the aid of the electric light, and to accustom the men to fall into their places without noise and confusion.

Care should be taken that during the operations the defenders should be kept in ignorance, if possible, of the nature of attack to be made on the forts, the time of its delivery, or the constitution of the attacking squadron. There would be no difficulty in ensuring secrecy on these points if the attack were in the hands of the Royal Navy. Keeping the garrisons of the Batteries in ignorance of the enemy's plans would have the advantage of obliging them to keep a proper look-out by day and night, of necessitating regular reliefs and attention being paid to the rule that a larger proportion of the garrison should not be kept on the alert than is compatible with the men having a proper amount of rest. It would also accustom Fire and Battery Commanders to dealing with situations requiring prompt decision, and those under them to acting according to circumstances instead of necessarily in accordance with a pre-arranged programme.

THE MANNING OF THE FORTRESS.

It may probably be assumed that if, as has been suggested, the complete manning of the fortress took place at intervals of 5 years, each Fire Commander would during that time have had sufficient opportunities of exercising his forts together, that he would have

acquainted himself with their capabilities, and would have determined on his course of action under any circumstances likely to occur, and that therefore he would be ready to take part in a manning of the whole fortress.

The value to be derived from these occasions from a fighting point of view, would depend on whether the co-operation of the Navy could be secured as well as that of the Royal Engineers and of the Infantry in the garrison, so that the programme might include attacks both by sea and land. If this were granted, much useful work might be done and valuable lessons learnt. It would be a matter for regret indeed if such an opportunity were not made the most of, for only when all the Batteries were manned would an attack on the fortress with any semblance of reality in it be possible.

If however there were no other result than that the whole of the Artillery of the fortress was posted for once exactly as it would be in time of war, this alone would be sufficient to justify its being mobilized.

COLONIAL ARTILLERY.

There is no reason for dealing separately with the case of the Colonial Artillery, as it all comes under the head of either Regular, Militia or Volunteer Artillery, and to which therefore a system of training for the Coast Artillery in England would be equally applicable. Certainly in the self-governing colonies there is no force of Imperial Artillery to form a nucleus and to provide a permanent staff of specialists. Its place would therefore have to be taken in this respect by the Colonial Artillery itself; and as its numbers are in all cases small, and would have to be largely increased on the outbreak of war, there is all the more need for this small body to be made thoroughly efficient.

The Coast Artillery in all the colonies exists, it is believed, only in the immediate neighbourhood of the guns which it has been raised to man; so that in the facilities which it would enjoy for carrying out its training it would have a great advantage over a large proportion of the Auxiliary Artillery in England. It should have no difficulty indeed under these circumstances in providing itself with a staff of specialists, if assisted in the first instance by instructors from Home.

In the Crown Colonies, where Imperial troops are stationed, the circumstances are similar to those in England, and therefore call for no special arrangements. In some of the colonies the attempt has been made to make Artillery act in the double capacity of Field and Garrison Artillery. This arrangement may have been a practical one when it was first made, but it is certainly so no longer in these days of guns and mountings of complicated construction and of an elaborate system of Coast Defence, when the work of Coast Artillery claims an undivided attention.

SUMMARY.

The main conclusions arrived at are :

(1) That the more important Batteries should be manned by their garrisons every year, and that the times of training of the different

corps should be arranged so as to allow of the Fire Commander of each of the more important groups of forts exercising his Command annually.

That it would be sufficient in the case of the other Batteries and "Fire Commands" if they were manned every second or third year.

That the whole of the Artillery of the fortress should be mobilized periodically at such intervals as may be found practicable.

(2) That in the allotment of garrisons to Batteries the Corps stationed nearest to the fortress, and therefore having the greater facilities for drill, should as a rule be those to man the more important guns.

(3) That quick-firing guns are specially suitable for Volunteers.

(4) That, to avoid mixing units, a corps should furnish its own reliefs, and that this should be borne in mind when computing the number of guns that it is capable of manning.

(5) That a Corps manning a work must also be prepared to provide reliefs for the specialists.

(6) That the aim of the instruction should be to qualify a Corps to man its Batteries independently in every detail; but that this principle should not be carried so far in practice as to trust inexperienced men uncontrolled in positions of responsibility.

(7) That in training a Corps new to Coast Defence work the Regulars should afford it every assistance, but that it should gradually be placed in a position to carry out its own training. That the drawing up of the programme of work however should remain in the hands of the Regular Artillery, who would also take up the instruction again in case of any changes in drill or in the armament, and would always continue to exercise a strict supervision over the work.

THE TRAINING TOGETHER IN PEACE TIME THE GARRISON ARTILLERY FORCES OF THE EMPIRE, INCLUDING REGULAR, MILITIA, VOLUNTEER & COLONIAL ARTILLERY.

BY

LIEUTENANT-COLONEL A. W. WHITE, R.A.

“MENS SANS IN CORPORE SANO.”

COMMENDED ESSAY, 1895.

GENERAL REMARKS.

MILITARY training is the means to an end. Unlike the pursuit of literature and art, it has no merit in itself; it affords no cultivation to the intellect, nor does it help to swell those powers by which civilization wrings subsistence from the crude forces of nature. Let us therefore approach the subject in a purely utilitarian spirit, endeavour to regulate supply to demand, and seek our wares in the cheapest market. Our demand is military efficiency; the means of supply is military training, and this, according to the principle just enunciated, we would fain minimise to the utmost compatible with the complete satisfaction of our requirements.

Military
Training
generally.

With this idea as a starting point, we may now proceed to consider the question of the training of that portion of our military forces whose function is the defence of the great maritime fortresses of the empire, and of those docks and coaling stations upon the secure possession of which our naval supremacy depends.

The training
of Garrison
Artillery.

Let us here glance at the constitution of the force with which we are concerned.

Garrison
Artillery;
its composition
and
conditions of
efficiency.

Our GARRISON ARTILLERY is made up of three component parts.

1st. The Professional.

By this is meant the embodied units, including the Regular Artillery, and certain local companies in permanent military employ.

2nd. The Semi-Professional.

Under this heading is included the Militia of the British Isles, and those companies in the Colonies which, though not permanently embodied, are brought under military discipline at stated periods.

3rd. The Non-Professional.

This includes all Garrison Artillery that is under training, but not embodied and subject to military discipline in time of peace. In this category must be placed the Volunteer Garrison Artillery of the United Kingdom, and the great bulk of the Colonial Artillery.

What we have to determine is how to bring it about that, when on the outbreak of war, these diverse elements are suddenly assembled, they shall at once amalgamate to form an efficient working organization.

But what, we may ask ourselves, is the meaning of the term *efficient* when applied to Garrison Artillery? and to this question we may fairly reply, that looking to the purposes for which the Garrison Artillery is maintained, we may judge the force to be efficient, if it is capable of supplying all the known wants of the fortified places, and of making the best possible application of their armament in actual warfare.

Now it is evident from this point of view, that before we can venture an opinion on the system of training best suited to the force, we must have a clear understanding of the organic principles upon which the defence of coast fortresses is to be conducted; if instead of beating the air, we are to direct our training to definite ends.

At this stage of the enquiry, it may not be unprofitable to see how problems of an analagous kind are habitually disposed of in every day life.

If we look into the working of our great corporate institutions; our railway companies, our gas companies, and our great mercantile firms, we shall see two great principles invariably in operation, viz.: "unity of management," and "division of labour."

And we shall further see that the division of labour is carried out by a minute classification of work.

For differences of kind;—By departments.

For differences of quality;—By gradations of responsibility.

It is certain moreover that the tendency of the period is increasingly in the direction of sub-division. In every industry the departments become daily more numerous, while individual labour is at once more circumscribed in its range, and intensified in its technical character. To put the matter simply the world has recognised that the "Jack of all Trades is the master of none;" hence "one man one work" is now the order of the day.

There is yet another point which we must not overlook as characteristic of all associations for corporate labour in civil life; it is that no one man, however capable he may be, is ever permitted to be indispensable. A process of instruction is always silently at work, and every man's possible successor is to be found in his immediate subordinate. Thus the principle of stage management enters into the national life, and in the Drama of Labour there is an understudy for every *rôle*.

Laying these things to heart and assured that laws which have proved successful in the industrial world may be advantageously applied to military life, we propose to see if it be not possible by their aid to satisfy the needs of our fortresses, and yet vastly simplify the training of their *personnel*.

Our Coast Fortresses,¹ as we all know, differ widely in the character of their works and armaments. In considering the duties of the *personnel* however, what applies to one may be said to apply to all; the

¹ The term Fortress here and elsewhere in this Essay is used to cover all Coast Fortifications.

Organisation
in its relation
to training.

Analogies in
civil life.

Fundamental
Rules.

Duties in
Coast For-
tresses gener-
ally similar
and point to
similar train-
ing

constituents of the garrison may indeed vary, but the duties which it will have to perform in time of war are pretty much the same, wherever there is a water area to be guarded, and batteries to defend it.

If, therefore, we consider broadly the typical requirements of a Coast Fortress, and can show how by a suitable training, in connection with a suitable organisation, it is possible to provide for those requirements, we shall have done all that is necessary.

Now the first point to note in this sequence is that in every fortress the character and position of the works and armament determine absolutely what the garrison *ought* to be, not only in numbers, but also in kind.

Requirements
of Coast
Fortresses in
general.

To begin with, there must be a gun detachment to every gun that is to be worked, and a Gun Captain to every gun detachment. To every group of guns, there must be a Gun Group Commander (as we now call him) to supervise the group in action, and make the group corrections according to the rules of gunnery. For every fort or collection of gun groups, there must be a superior officer in immediate command, and in every work there must be a subordinate staff of specialists to do the skilled service, and manipulate those adjuncts in gunnery with which we are all acquainted. Again, for every independent group of works covering a distinct water area, there must be an officer for general control, whether we call him a Section C.R.A., as we did a little while ago, or a Fire Commander as we shall do in future. It is besides necessary to provide that every group of guns in action shall have the attention of an officer (or qualified person doing officer's work) whose business will be to maintain the fire of the group upon the hostile target. The methods employed we need not here describe; suffice it to say that considerable presence of mind, considerable practice, and a large amount of technical information must be forthcoming in whoever undertakes this duty.

Thus it happens that :—the number of guns determine the number of gun detachments, and the number of groups the number of Gun Group and Range Group Commanders. The number of the batteries, or collections of groups, determine the number of Battery Commanders, while the number of sets of batteries associated for separate command determines the number of Fire Commanders.

It should be observed that these arrangements of the armament of a fortress into groups, batteries and fire commands are very seldom matters of choice. They are generally dictated by the imperative necessity of grouping guns together which are of the same nature and have similar areas of fire; of making battery commands wherever the groups are too far apart to be under the immediate control of a single officer, and of creating separate fire commands wherever the situation of the works is such that they cannot be conveniently associated for tactical employment.

We are thus brought face to face with the fact that in every Coast Fortress there is always a *normal* Artillery Garrison, and if the *actual* Garrison differs from the *normal* one, either in quantity or quality, it

does so at the expense of the fighting power of the place.

Artillery
Garrisons;
normal and
actual.

Now we know very well that the actual Artillery Garrisons of our Coast Fortresses, as laid down in the Schemes for Mobilisation, do in very rare instances conform to the normal or theoretical proportions. As a matter of fact the numbers are generally insufficient, especially if we consider the necessity for reliefs, and of provision for casualties. It is not, however, in deficiency of numbers that the matter is most serious. The worst discrepancy is, as a rule, in the matter of quality so to speak.

The supply of unskilled labour may in most cases be supplemented in time of war by drafts upon the local labour market, but the skilled labour, in proportion to its technical character will be less and less possible to extemporise. Moreover no super-abundance in one department of skilled labour will in any way make up for a deficiency in another.

Skilled and
unskilled
duties.

By skilled labour, using a certain freedom in applying the term to the duties of Garrison Artillery is meant—

- (a.) Officers' duties, that is to say the higher technical duties involving discretionary powers.
- (b.) Specialists' duties, that is technical duties requiring very skilful manipulation and a certain amount of local knowledge—as for example the duties of artificers, electricians, telegraphists, position-finding and depression range-finding operators, to which may be added certain minor employments such as those of magazine and store-men entailing peculiar responsibilities and requiring intimate acquaintance with the batteries.

With respect to officers' duties, there are many difficulties all more or less embarrassing. In the first place the officers and superior non-commissioned officers available on the outbreak of war will generally be an heterogeneous body taken in part from the regular forces, and from the auxiliary branches. Many of them will have been non-resident in times of peace, and their qualifications will have been difficult to ascertain. Secondly, the relative proportions of each rank will hardly ever tally with the posts which have to be filled according to the Defence Scheme. Thirdly, the proportion of officers to men according to the regimental establishments may prove very unsuitable when officers and men are distributed according to armament requirements.

All this difficulty is plainly due to the fact that in the Garrison Artillery, the organisation by companies and divisions is for purposes of administration and has little to do with the requirements of war. In this respect a Garrison Company is altogether different from a Field Battery, which is not only an *administrative* but also a *fighting* unit.

As regards the specialists, there are also many obstacles to satisfactory working, and these unfortunately are more in practice than in theory. In *theory* we know that with the exception of officers, the entire fighting staff of every fortress should be found by the Regular

Artillery and be maintained at war strength in the district to which it belongs. The recognition of this principle¹ is perhaps the greatest of all the advances made by the Garrison Artillery since the close of the Crimean War. The idea is that, in every district, the Commanding Officer of Artillery should be responsible that, whether the companies in his command, be few or many, he should always have the *skilled personnel*, in full strength and proper proportions ready to his hand in case of war. It is assumed by regulation that a Commanding Officer can at a moment's notice call into existence a living chain ready to transmit his orders from his command cell to the remotest outpost, and to execute them by pre-arranged and often rehearsed co-operation. Now, without doubt the more energetic the Commanding Officer, the more nearly will affairs approach to this ideal condition. But alas! there is no picture without a blemish. Excellent as is the theory of the District Establishments, it is subject to sundry drawbacks in practice. There is in the first place a want of elasticity in the whole plan. For example:—The establishment of a given district may have been fixed before all the works belonging to it were completed, and before the position-finding, electric lighting, and the telephone system belonging to it had been installed. According to theory, no doubt, the specialist staff should have been augmented step by step as these adjuncts were brought into play, but we all know that such a course is practically impossible where affairs are concerned which depend upon annual estimates and Parliamentary votes. Somehow matters have a tendency to crystallise, and it may easily happen that a very modern fortification has already a very obsolete District Establishment.

Another difficulty in connection with the District Establishment is the want of a completely satisfactory method of recruiting them, and of an exact standard of qualification for every one of their grades. Certain specialists are supplied from the Woolwich Arsenal and from the Schools of Instruction, but there is, to say the least of it, an element of vagueness in the mode of their selection, which makes it impossible for a Commanding Officer to place any great reliance upon their technical skill until he has had personal knowledge of what they *can* individually do, and what they *cannot*. On the other hand the majority of the specialists are drawn from the service companies quartered in the district, and are trained locally; a system which works well only where the number of companies is in fair proportion to the number of specialists they have to find.

Drawbacks of this kind are serious in proportion as the skilled labour is important, for just as one weak link in a chain enfeebles the whole, so the absence or incapacity of a single specialist may go far to depreciate the fighting value of the strongest combination of works and armament. An excitable or ill-taught position-finding operator would in action nullify the best manned group of the most powerful of our modern guns, and a bungling artificer might do incalculable mischief in half an hour.

¹ No change in this respect has been made by recent orders associating D.E. men with Companies, since they remain localised.

A. FORTRESS ORGANISATION WHICH WILL FACILITATE TRAINING.

Distribution
of personnel.

Now the question arises how we are to maintain in every fortress a complete organisation for war and adapt to it a satisfactory system of training the several components of the Artillery Garrison.

How best to apply an Artillery Garrison which has been selected by *administrative units* to a fortress, the duties of which must be classified in *fighting departments*, is a problem to which no general solution can be dogmatically insisted upon. What ought to be done exactly is difficult to say; what ought *not* to be done is very certain. For example, any Defence Scheme which disposes of the manning details of the Artillery by the assignment to forts and batteries of regimental units and arbitrary complements of specialists, is not merely absolutely worthless but positively harmful.

Probably the best way to deal with the artillery portion of a Defence Scheme is to draw up a schedule of a *typical* or a *normal* garrison for a fortress, assuming that the fixed armament, movable armament, and auxiliary appliances are all to be brought into simultaneous operation, and that the *Personnel* is to work in one relief with a suitable proportion of each department in reserve. Side by side with this may then be placed the schedule of the actual artillery garrison according to the mobilisation scheme, due allowance being made for casualties, especially those caused by deficiencies in the numbers of the auxiliary units. It will then be seen what the *possibilities* of the defence are, and how the distribution of the Garrison must be actually made. As a rule a limited number of Battery Commands will have to be selected in each Fire Command, to be brought into activity at the outbreak of war, and in the same way, in each Battery Command so selected, there will be a limited number of groups chosen for activity:—the principle being to attend to the essential points first, leaving certain portions of the defence to be dealt with as opportunities occur. It will have, however, to be always remembered that whatever works are selected for activity, they must be completely garrisoned, that is to say, for every duty, however trifling, there must be a qualified man, and deliberate provision must be made to replace him by a man of similar qualifications in case of accidents. In thus fitting the Garrison, so to speak, to the fortress which has been made for it, a good many more or less conflicting conditions will have to be satisfied.

For instance, the most important groups should obviously be assigned to the regimental units most certainly able to man them properly, nevertheless the sentiment of *esprit de corps* in these several branches should be respected, or trouble will ensue.

The task will be no easy one, but its worst difficulties will be escaped wherever a complete and efficient District Establishment has been kept up in time of peace.

Beyond this, the most serious and certainly the most delicate matter to be faced, is the distribution of the officers, but here the observance of certain general rules will probably smooth the way. It should clearly be laid down that under no circumstances should any person be

appointed to a post in the chain of command for which he has not shewn himself, not merely presumably, but actually fitted, and that therefore in every case where an officer, be he of the Regular, Militia, or Volunteer services, is not efficient in respect to those duties for which his rank renders him otherwise suitable, he must be set aside as a dead-head for fighting purposes, and relegated to general administrative duties exclusively. By this expedient will be avoided the troublesome dilemma of having to reverse the order of precedence, and place juniors practically in command of their seniors or else of permitting inefficiency during peace where it would be ruinous in time of war. In all probability if the system here advocated were to be strictly carried out general satisfaction would be the result. In the regular service the setting aside of any officer in a local Defence Scheme would be felt as such an extreme disgrace that it would never happen twice to the same individual, and it would in all probability very seldom happen at all. The same may be said of the Militia; and as to the Volunteers, especially the Volunteer portion of the Colonial Artillery, the rule would probably be acceptable, as it would afford to each officer the opportunity either of placing himself in the category of effective soldiers or of electing to retain a position applicable only to time of peace and which would soon come to be recognised as an honorary and social distinction and nothing more.

Where the officers' commands cannot be filled by efficient officers the only course open to the organiser will be to fall back on non-commissioned officers, and these should thereupon be given the opportunity of learning the duties they have been selected to perform.

A TRAINING TO SUIT THE ORGANISATION.

When we consider the existing system of training of our military forces in general, and of the Garrison Artillery in particular, it must be confessed that though many beneficial changes have been introduced of late years, there is still some room for improvement. The idea that all training should be for a definite end, and that the average progress made should bear a reasonable proportion to the time occupied, has taken root but slowly. We have indeed recognised the distinction between essential and non-essential training in the separation of ceremonial and service drills, and of skilled and unskilled duties; we have also given way to the necessity of advanced courses of technical instruction in particular directions. But there is still a want of clear perception as to the purposes of training, and much confusion between training for war, and other classes of instruction. There are many survivals in our military routine of the opinions and habits of a past age when the soldier enlisted for life, and the weapons and appliances of war were so simple that time would have hung heavy on his hands, but for a thousand pendants invented expressly for his benefit, and hedged about with extraordinary pomp.

Those were days when every officer of equal rank was assumed to be equally capable, and the private soldier had no individuality, but was a strictly interchangeable factor, for ever under instruction, yet never proficient. The application of advanced science to the art of war, and

System of
training—
past and
present.

the adoption of short service in the army has made this system impossible any longer. We must henceforward perforce make up our minds what each soldier has got to learn, and teach it him as quickly as possible, for time is short and needs are pressing.

Means of
Instruction.

Laying aside special courses of instruction outside the routine of regimental life, which are for the most part applicable to officers, non-commissioned officers, and specialists only, the means of training in the Garrison Artillery are :—

Drill.

Barrack-room Instruction.

Gun Practice.

Mannings for Exercise.

Drill.

As regards drill, no remark seems necessary except that it would be well if the difference between learning a drill for the first time, and going through it afterwards as an exercise, was always kept fully in view. It should also be observed perhaps that where a unit is told off to a particular fortress, but is non-resident, all its drills should be with the class of ordnance mounted in that fortress, and have a systematic reference to the duties to be performed there.

Barrack-
room instruction.

With respect to Barrack-room Instruction, there is a great deal more to be said than is generally supposed. In a properly fitted-up instruction-room, and even with no other appliances than a black-board and a piece of chalk nearly every duty can be taught part by part if not as a whole, and there are many elementary processes which can be far better explained this way than in any other manner. Even the higher duties which officers have to perform in the chain of fortresses command can be taught up to an advanced stage by indoor work. Take for example the duties of a Fire Commander. A very simple exercise can be carried out, which if properly conducted will be of the greatest assistance to him in his duties of identification, and classification of foreign ships.

Some particular navy having been selected for the occasion, the officer who takes the part of Fire Commander will in the first instance be supplied with the regulation identification cards, such as he would have at his command post. Another officer acting as umpire will show him one by one the photographs of certain ships belonging to that navy, the margins showing names, class, &c., being carefully covered up. The Fire Commander will then identify the ships to the best of his ability, and the umpire will note down the result, carefully recording the time taken in each case. The exercise may be made more difficult by dispensing with the identification card, and it may be extended by requiring the Fire Commander to predict the square on his Fire Commander's chart which each ship will have reached at the moment when his (the Fire Commander's message) to the Battery Commander deputed to deal with that ship, will have reached its destination; certain conventions as to time, speed, and ship's course, based on actual experience, being agreed upon for this purpose.

The Fire Commander can be further required to frame a proper message for each Battery Commander in the time allowed him for identification, and his work may be tested by sending these messages in their proper order to officers in another room representing the several Battery Commanders concerned, and requiring them each to show, on his own chart, the square towards which he would turn his depression range-finder or his gun of direction in order to pick up the vessel referred to in the Fire Commander's message. In each case the umpire (always noting the expenditure of time) will be able to say where the ship ought actually to be at the moment in question, and its relative position to the other vessels of the fleet and from this he can decide whether any mistake or confusion of *objectives* will have occurred, and be able to show whether the Fire Commander has done his work satisfactorily or otherwise.

An almost endless variety of exercises of this nature may be easily devised for the benefit of those holding posts in any chain of command from the Fire Commander to the Gun Group Commander, not even forgetting the humble but necessary dial numbers. In many instances, especially in the case of non-resident units, working models of the Forts and their appliances will be found of immense use for instruction. If kept under lock and key when not required for instruction there could be scarcely any objection to their employment. Drawings and photographs too, though in a less degree will be found beneficial.

Concerning practice, there are a good many erroneous ideas in the air. On the one hand gun practice is expected to do for us what it can never do, and on the other hand, its true uses are scarcely understood. Some officers are under the impression that practice can be conducted so as to really show what takes place in actual warfare, but this is not the case. Garrison Artillery practice is, it is true, incomparably nearer the real thing than is that of the Field Artillery, because the Garrison Artillery alone employs moving targets bearing comparison in size, speed, &c., to the vessels of war, and alone is obliged to do without those misleading aids to accuracy of fire with a knowledge of the practice ground, and of the approximate distances of the targets, invariably furnishes to those practising over land ranges. Nevertheless, although Garrison Artillery practice may embrace *some* of the important features of actual service, it can never be carried out under *true* service conditions, on account of the many precautions for safety which must be observed, even in the least frequented waters.

The real value of gun practice is, first, that it accustoms the gun detachments, to actual fire, with its attendant conditions of noise and smoke. Next that it is an exercise for the officers, and a test for the accuracy and uniformity of the work done by the Gunnery Specialists. Thirdly, that it affords a useful opportunity of trying the mountings, and all the appliances connected with the guns made use of.

Now as the first of these uses, nothing particular need be said, but for the rest, we must remember that the most careful notes are needed to be taken, moment by moment, if full value is to be got out of the ammunition expended. From this point of view all practice except just enough of the elementary sort to accustom the detachments to

work quickly, should be treated as an experiment, and the programme should be so arranged that the conclusions come to may not be confused by too many variable factors. Thus, if it is desired to test the *personnel*, the conduct of the gun must be beyond suspicion, or means taken, such as clinometer readings, and careful air-spacing to make sure that its shortcomings are not put down to the layers or to range-takers. Again, it is obvious that to bring home the errors made at practice with certainty to the individuals who have caused them, means must be taken of registering what each man's contribution has been to the sum total of the operations performed, hence the necessity for a great deal, which could never by any possibility be done in battle.

It must always be remembered that practice is a costly thing, and that there is no excuse for throwing away ammunition for the sake of apparent smartness.

Nor ought practice ever to be carried out with a higher nature of gun than the requirements of the occasion demand. If, for instance it be only desired to exhibit the service method of ranging upon a fired target without the help of a range-finder, why make use of a 9-in. gun when a 3-pr. quick-firing would do just as well?

Manning
Exercises.

Manning exercises, besides being useful to show the completeness or otherwise of the manning tables, are an excellent mode of instruction in the combined duties of specialists and non-specialists.

It may be now and again a good thing to man an entire Fire Command both by day and night; on which occasion the Fire Commander and his under-study should take the opportunity of making themselves thoroughly at home in their command posts. As a rule, however, the manning of a Battery Command or even of a single group will answer all purposes of instruction, and it will be by no means necessary that every non-specialist should be present. The detail may often with advantage be limited to the officers, specialists, and the Gun Captains and layers of each gun, a few men being told off to run the guns up and back, when occasion required.

All mannings for exercise should include the use of two or three moving targets (fast steam launches from choice) which are quite as useful when friction tubes only are employed as when actual practice is carried out. If, with each gun, an umpire looks over the left hand sight set without deflection, while the layer works on the right, he can by making an allowance for the time of flight, and looking along the sight at the expiration of such time after the tube has been fired, see exactly where the shot was due to strike, and thus judge the effect of the imaginary round.

In this exercise, the action of wind cannot be considered, and the precision of the range-finding must be independently tested, but all the other stages of gunnery which lie between the Range Group Commander and the gun layer can be thoroughly overhauled. In manning exercises, as well as in actual practice, the presence of *selected* instructors as umpires will be found advantageous, especially when the Militia and Volunteers are employed.

Obstacles to
Instruction.

At the present time, the means of training are ample, but there are sundry obstacles to the best use being made of them.

In the Regular Artillery, as in the army generally, instruction is woefully hampered by the inordinate demands of administrative duty, and it is positively startling to think of the enormous proportion of officers, N.-O.C.'s and men who are employed every day in merely conducting their own house keeping, so to speak.

In the Regular Artillery.

In the Militia the shortness of the annual trainings and the constant changes in the muster roll are the chief enemies to advanced instruction, and in the Volunteers and Colonial forces, any limpness there may be, is due, as a rule, to want of the knowledge of what would be really expected of them in the presence of an enemy.

In the Militia and Volunteers.

Putting aside instruction other than what is distinctly for war, we may consider the training of the Garrison Artillery in two parts.

Aspects of Training in the Garrison Artillery.

1st. The separate training of the units.

2nd. The combined trainings of the Fortress Garrisons.

The training of Regular Artillery has to be carried beyond the point of what is required locally. The Service Companies, we must remember, are available for duty in any part of the world. They are training schools for their own reserve, and have to provide a sufficient number of specialists to supply the wants of the other branches as well as their own, when mobilised for war.

Separate Training of the Regular Artillery.

In training the Regular Artilleryman therefore, we have first to make him a soldier, and by the aid of precise exercises instil into him those habits of implicit obedience without which a soldier is worse than useless. This we do at a depot or other place of instruction for recruits before he joins a Service Company. Having made him a soldier, we have to make him a *gunner*, that is to say a soldier who has become so intimate with guns and their adjuncts that he will afterwards instinctively fall into his proper place in any drill or other Artillery duty he may be called to, although the precise detail may be new to him.

Company Training.

Company training, further includes the sorting of the gunners according to the military aptitudes of each individual, with a view to the making of specialists and the selection of N.-C.O.'s, both matters of the utmost importance.

But concurrently with this general training should come the preparation of each man for his particular duties of the local scheme of defence. The duties of the company men (with the exception of Gun Captains and gun layers) will it is true be generally unskilled, still some education of hand and eye is needed for their due performance. A soldier may, for instance, be told off as No. 5 in a 9.2-in. B.L. Gun Detachment. His duty will be merely *to stand on the left of the gun, attend to hoisting tackle, raise projectile, ram home, run up and elevate*, but it is surely the business of the Officer Commanding his company to see that whatever other accomplishments he may happen to possess he can at least do *that duty* and do it perfectly; also that he is able at a pinch to do the work of the other man at the same gun, whose place he may have to take. Thus while the main object of company training is to carry out preliminary instruction and select probationers for the district establishment it should also include the preparation of a certain

number of Gun Captains, gun layers and handspike numbers for their own particular duties in the scheme of defence, always remembering that each man should himself know what those precise duties are, and where they are to be performed, in order that he may take some interest in them.

Regimental
Training.

Regimental training, in contrast to company training should comprise the advanced training and regular exercise of the specialists, and the working together at drill and at gun practice of the specialists and of the Service Companies.

If this is done and with sufficient thoroughness, it will be found that in all cases where the Regulars are combined for exercise with other branches of the Garrison Artillery there will be little in reality for them to learn but they will, as it is only right they should, be agents of instruction to the non-professionals associated with them.

Training of
Specialists.

As regards the training of the specialists, including that practice without which no adequate level of expertness can be kept up, it cannot be too often insisted upon that no amount of attention is too great to bestow it. It is the business of Colonels and Lieut.-Colonels to very jealously protect the specialists as a body from being called upon, on pretences of emergency, to perform fatigues and duties which are the proper function of the ordinary unskilled company men. A Commanding Officer who wishes to see good work done should be active in stimulating the zeal of the Officer Instructors responsible for technical training, and in trying to create emulation among the operators.

Nothing will conduce better to this end than for the Commanding Officer to keep a list of every class of specialist showing the capabilities of each man in order of merit.

It is suggested that specialists (position-finders and depression range-finders) should as far as possible be identified with particular posts and particular instruments. Under these conditions they will be more likely to take a pride in their work than they otherwise would, for there is a vast difference we must recollect between what any man is in *general*, and what he is in *particular*. To follow once more an analogy of civil life, it is one thing to be an engine-driver on the Midland Railway, and quite another to be *the* engine-driver of the Manchester Express.

Militia Train-
ing.

The separate training of Militia must follow the same lines as that of the Regular Artillery, but it is immensely simplified by the circumstance that the Militia are not liable for foreign service, and are as a rule more distinctly localised; also that they have no specialities to think of, and no skilled details to furnish (laying aside what officers may do) except Gun Captains and gun layers for particular guns in particular fortresses. It would seem therefore very possible to considerably reduce, and at the same time systematise the preparatory drills of this branch. The Militia soldier having learned a few parade movements and the art of marching past—a tribute to custom and regimental *esprit de corps*—need scarcely be troubled with any general artillery training, but simply set to work to learn his particular duty in the gun detachment to which he has been told off, and it would be a good plan, perhaps, if these

duties were made generally to correspond with the number of trainings received, always provided that the special aptitudes of individuals were duly taken stock of.

Assuming that the separate training of the Artillery Militia could be advantageously shortened as here suggested, there would be more time left for practice and practical exercise in combination with the Regulars to which we shall presently refer.

The members of the Volunteer Artillery at home and in the Colonies are not soldiers, nor does it seem desirable that any attempt should be made to make them so. They are merely citizens who have agreed to perform in time of war certain duties in aid of the Regular Artillery, and learn those duties in time of peace. As the Volunteers are an unpaid force, it is neither right nor expedient to throw more work upon them than is absolutely necessary. We may therefore assume that in every scheme of defence the Volunteer Artillery will be told off to those works which are of the least importance, and provided with the simplest armaments.

Volunteer
Artillery.

The Volunteer Garrison Artillery being strictly localised, there is no question of their services being required elsewhere than in the works with which they are thus associated. There should be, therefore, very little difficulty in reducing their company training to such a minimum that the busiest of these citizen gunners should not be able to complain of the tax levied on his time and attention. A certain amount of drill for the purposes of military display would no doubt be advisable, but this need not occupy much time, nor need we consider it here. As to drill for disciplinary purposes, that is out of the question in a force which passes under military law only in time of war, and in which the sentiment of patriotism and the pressure of public opinion must take the place of that unquestioning obedience which is second nature to the professional soldier. The training of Volunteer Officers and higher N.-C.O.'s, that is of those who aspire to take their place with regular officers in the chain of fortress command, is a subject distinct from the training of the men and will be noticed in considering the training of officers generally.

There is obviously no maximum limit to what we desire in the Artillery Officer of the Regular Army. He cannot possibly possess too much general knowledge, or too many technical acquirements. He is at once a leader, an instructor, and an administrator, and he is responsible for doing his share to keep up the general standard of efficiency among the officers of his own and other branches. For him there is no short enlistment, his services are given for life, and his duties range over an extended sphere, embracing the possibility of service in the field and at sieges, as well as in the defence of coast fortifications.

The Training
of Officers—
Regulars.

There is for him besides the chance of at any time being called to staff employment, and in the future, the prospect of higher command requiring a knowledge of every arm of the service.

For this reason it is difficult to say to what branches of military study he ought most especially to devote himself, so long as he keeps himself abreast of the times. Happily the Artillery Officer of to-day is nowhere behindhand in this respect. He begins with an excellent general

and military education, and he finds ample opportunities in the service of advanced study, with many openings for special instruction such as the classes at the Artillery College and in the various branches of the School of Gunnery. So far good, but granted a very high general level of proficiency, it may be doubted if the education of Artillery Officers is sufficiently *uniform*, sufficiently controlled, and directed with sufficient precision towards definite ends. In particular it is very questionable if enough attention is paid to the local technical duties which after all constitute for the time being the one thing positively necessary especially in the Garrison Artillery. Stirred by a spirit of adventure, or it may be love of change, officers are apt to regard their residence in any one district as so very temporary an episode, that they are tempted to neglect to study as carefully as is desirable the part they would have to play in local defence should war break out (as war generally does break out) at a moment's notice. It is very well to be a smart parade officer, good at games and sports, a linguist, a *fin du siecle* tactician, and to have it may be the letters G., P.A.C., P.S.C., and so forth annexed to one's name in the army list, but if being Range Group Commander of a certain group an officer has never practised his special duties as such, and is unacquainted with the water area seen from his command post, can he say that he is really in that state of readiness for active service which the true professional soldier should be?

Fortunately, we are dealing with a body eager to accept the smallest hint in the direction of improvement, and a short coming of this kind has therefore only to be detected in order to disappear forthwith.

Militia and
Volunteers.

In the Militia, and still more in the Volunteer forces, it is plainly out of question to demand from Officers anything more than the minimum knowledge which is necessary to enable them to discharge the duties they have undertaken. More than this, if forthcoming, should of course be thankfully recognised. There are at the present time, and there will no doubt always be officers of Auxiliary Artillery possessing great scientific attainments, who find something more than recreation in military pursuits.

It is not however the exceptional officers that we are concerned with. What we want to establish is a certain minimum level of capability associated with each step in rank, and which is absolutely insisted upon as a qualification for that rank. To meet this requirement Militia and Volunteer officers might perhaps with advantage be given greater facilities for training in company with regular officers in the fortresses to which they belong. There seems no reason also why officers in the Colonial Artillery should not be affiliated for instruction to the Service Companies which form part of the garrisons of the Colonial Ports, nor why Colonels of Artillery should not everywhere be made responsible to a certain extent for the average proficiency arrived at by the Volunteer officers in their districts. A little energy and management will go far in this respect, and if the Volunteer officer had clearly put before him, that he was not asked to pursue an indefinite curriculum, but only to fit himself for a responsible post, he would in all probability rise to the occasion, and readily meet half way any arrangements suggested for his benefit. Again during Militia training, it might be

made the duty of the Royal Artillery to give each officer a certain number of hours exercise in his special defence duties, with the assistance of parties of non-commissioned officers and men belonging to the district. It might also perhaps be arranged that Militia officers requiring more teaching than they were able to get during their annual training should stay on in the district for a short period of special instruction after their camp had been broken up. On the same principle it might be conceded that officers of non-resident units wishing to acquaint themselves with the details of the fortress to which they nominally belong, should be allowed to come there for stated periods; all or part of their expenses being paid by the country.

Such arrangements in addition to the other classes and regulation means of instruction would, if systematically carried out, probably do all that is really required for Militia and Volunteer Artillery officers, and what has been said of officers might be made, with modifications, to apply also to the higher non-commissioned officers, especially those told off to officer's positions in any defence or scheme.

If the separate trainings of the units have been properly carried out, combined trainings should pass off without a hitch, and very few should be necessary. It will not be very often possible to assemble all branches for simultaneous training, but it will be fairly easy, as opportunity occurs, to combine the regular artillery with each of the other branches separately. Combined trainings are likely to be most useful in the form of

Combined training of Regulars and Auxiliaries.

Barrack-room Instruction for officers and non-commissioned officers.

Combined manning exercises.

Combined gun practice.

In Barrack-room instruction the method most likely to be found successful would be to combine a few Militia or Volunteer officers at a time, with a tolerably large number of regular officers who are already expert at the exercise to be followed up.

Barrack-room.

In combined manning exercises the scheme of defence should certainly be strictly followed, but it may be advisable to substitute regular officers and regular non-commissioned officers for auxiliaries in certain posts during the instruction of novices. Thus for instance, if the Gun Captains, and Gun layers of a group were unusually shaky, it might be as well to give them for the time being the help of a Gun Group Commander from the Regulars.

Combined manning exercises.

By combined gun practice is here meant, not gun practice where the detachments are mixed, but either gun practice by regulars under their best officers, with the Auxiliary officers and superior non-commissioned officers in attendance to watch the proceedings under the guidance of a specially selected instructor, or else, gun practice by the Auxiliary Artillery with selected Regular officers as umpires; the proceedings in either case being followed next day by a lecture and discussion.

Gun practice.

There should not be any difficulty in carrying out this idea: probably

the war department would be willing to assist, but in any case there need be no obstacle to the attendance of Regular officers at Militia and Volunteer practice, nor should it be found impossible to time the practice of the Regulars so as to suit the convenience of the Militia and the Volunteers.

CONCLUDING REMARKS.

Retrospect.

And now we have come to the end of our inquiry into the question of a training intended to meet the general requirements of the Garrison Artillery, and the exact needs of its three branches in respect to their local duties, it would be well to glance briefly at the ground over which we have travelled. We began with the proposition that military training was valuable only as far as it produced military efficiency. We saw that efficiency in the Garrison Artillery might be considered to be attained when it was capable of completely fulfilling the needs of our coast fortresses and fortified harbours. We then saw that in order that this might be brought about by a suitable system of training there must needs be a suitable fortress organisation to which that training might conveniently adapt itself. We next came to the conclusion that the principles which govern the associations for collective industry in civil life might with advantage be applied to the organisation we were in search of, and that if we desired to have an efficient Artillery Garrison in an effective fortress, we must accept the motto "one man one work" as our guiding principle. After this we saw how that principle coupled with another almost as important, namely "to every man an under-study" could be turned to account in the difficult task of making our somewhat incongruous garrisons adjust themselves to the requirements of the fortresses, and we went at some length into certain difficulties inseparable from that undertaking. We next set ourselves to ascertain how best in time of peace we could train the various branches of the Garrison Artillery in all parts of the world, so that each man might when called upon be able to perform the work which in the process of organisation, we had narrowed to the utmost, and relegated to him individually.

Following up the enquiry we ultimately concluded that the existing means of instruction modified by a definite local bias would answer all purposes.

Finally we saw that by carefully training each branch separately and testing that training by small combinations of the Regular and Auxiliary branches, following the lines of the local Defence Schemes, we could without operations on any extravagant scale, prove satisfactorily that the great machine for war had been made perfect in detail and capable of immediate assembly as a whole.

Throughout our investigations we have carefully abstained from discussing the peculiarities of particular fortresses or of special armaments, nor have we entered into the minutiae of management in particular corps.

The requirements of particular fortresses are the affairs of the officers located in them, and the circumstances of particular corps vary only in

minor details which can be best adjusted by the officers that belong to them. Nor have we touched with the idea of suggesting improvements upon the rules and regulations which at present govern Military instruction in the several branches of the Artillery. Excellent articles on this subject have appeared from time to time in the pages of the R.A.I. "Proceedings," and the R.U.S.I. "Journal"; also in various miscellaneous periodicals to which those interested may refer. The great point we have aimed at has been to arrive at some general basis of action, knowing that when men are agreed on general principles they seldom differ seriously as to details.

The idea we have had in view from first to last has been to remove the process of mobilization for war from the category of *catastrophies*, into something which will resemble the daily assembly of labourers in a great workshop, to the ringing of the office bell, and all we have asked is common sense, and an high feeling of duty in all concerned.

If our conclusions are correct, we shall thus have shewn how when the cry "To Arms" shall go forth throughout the length and breadth of the empire, and the order to mobilise be given at home and abroad, every man of the Garrison Artillery, be he Regular, Militia, or Volunteer will be able to make a fair estimate of what he will be doing hour by hour from that moment to the time when he may lie down in his own bed in his own proper tent or barrack room, with a knowledge that to-morrow morning he will rise to the performance of definite duties, in his proper position in his own gun emplacement, in his own Battery in his own Coast Fortress.

If this can but be realised for each individual, we need have but little anxiety for the arrangements as a whole.

Our defence may indeed prove unequal to the power of the enemy, but we may be sure that it will have been vigorous to the utmost of human capability, and that we shall have for ever more the proud satisfaction of remembering that from first to last, there was *a duty for every man*, and that *every man did his duty*.

CENTENARY CUP.

COMMUNICATED BY

THE SECRETARY.

THE cup presented to the Regiment for annual competition by the Deputy-Adjutant-General, in commemoration of the centenary of General Sir John Macleod, G.C.H., first Deputy-Adjutant-General in 1795, was exhibited at the annual dinner on the 7th June.

It was manufactured by Messrs. Lambert of Coventry Street, and takes the form of an early Hanap, or double Gourd, Cup, of the 16th century, the stem being embellished with a mural crown, chased and pierced, and four chased reliefs.

These reliefs are oval medallions in *rèpoussé* work representing Horse, Field, Siege, and Garrison Artillery respectively, from designs by Captain G. D'A. Alexander, Royal Artillery.

The cup is 23 inches in height, and is provided with a cover surmounted by a figure of an Officer of the Royal Artillery in the uniform of 1795, from a design by Lieutenant R. J. Macdonald, Royal Artillery.

Round the foot of the cup is engraved the following inscription :—

“To the Royal Regiment of Artillery, in commemoration of the
“centenary of the appointment of Lieutenant-Colonel John Macleod,
“as first Deputy-Adjutant-General Royal Artillery, 1795, this cup is
“dedicated by Major-General F. T. Lloyd, C.B., Deputy-Adjutant-
“General Royal Artillery, 1895.”

The plinth is provided with a recess in which is placed an illuminated scroll of parchment containing a short history of the services of Sir John Macleod, as follows :—

Lieutenant-General Sir John Macleod, G.C.H., of the Raaza Clan, was grandson of Colonel Eneas Macleod, who served with great distinction in the campaigns of the Duke of Marlborough. He was born in January 1752 and joined the Royal Artillery Academy on the 15th March, 1771.

In 1775 he joined the force collected for the suppression of the Colonial Rebellion in North America, and in 1781 proceeded with the Army under Earl Cornwallis into North Carolina, a march of more than 600 miles in very inclement weather. He commanded the artillery in the signal victory of Guildford on the 15th March, over the combined Continental and American forces. On the return of the Army to England, he was specially presented to the King, and in the same year was appointed Captain on the Staff of Lord George Lennox at Portsmouth. In 1790 Captain Macleod was placed at the head of the Regimental Staff of the Royal Artillery, which had been increased during the American War to four Battalions and an Invalid Battalion.

In 1792-3 the Field Batteries, then called Brigades, had been equipped in a manner to give them increased mobility, and in 1793 Captain Macleod obtained permission to raise and equip two troops of Royal Horse Artillery, of which he personally commanded one. Two more troops were raised later in the year, and others added as necessity arose. In 1725 the artillery had been increased to 25,000 men, and the Master-General of the Ordnance, in concurrence with the Commander-in-Chief, the Duke of York, was authorized to appoint Lieut.-Colonel John Macleod, Deputy-Adjutant-General Royal Artillery, to which appointment he was gazetted 27th March, 1795, and on the 21st August, 1797 was promoted Regimental Lieut.-Colonel, and on the 29th April, 1802 to be Colonel. In the year 1808 Colonel Macleod was ordered to raise the 10th Battalion.

Early in 1809 a large force was organised under the Earl of Chatham, Master-General of the Ordnance, to proceed to Holland, and Colonel Macleod accompanied it as Brigadier-General in command of the Royal Artillery. He directed the artillery operations at the siege and capture of Middleburg and Flushing, and returned with the Army to England in September to resume his work as Deputy-Adjutant-General. In the same year he was promoted Major-General.

The duties of the appointment became during the year 1809 more and more onerous and important, owing to the return of Sir Arthur Wellesley to the Peninsula, and steadily increased during the Wellington campaigns, which finally ended in the victory of Waterloo and the Occupation of Paris, by which time the strength of the artillery had increased to 26,000 men and 14,000 horses.

Major-General Macleod was promoted Lieut.-General in 1814 and received from the King the Grand Cross of the Guelph in consideration of his eminent services. He had married in 1783 the Lady Emily Kerr, daughter of the fourth Marquis of Lothian, and at one time all his four sons were serving under Lord Wellington in Spain. The eldest, Charles, was killed at Badajoz, while commanding the 43rd Light Infantry, and his epitaph in Westminster Abbey is extracted from Lord Wellington's despatch on that occasion. His eldest daughter became the wife of Genl. Sir Robert Gardiner, G.C.B., K.C.H., Royal Artillery.

In 1827 Lieut.-General Sir John Macleod resigned his appointment and was subsequently appointed Director-General of Artillery, the duties of which office he discharged till his death in 1833, when he was Senior Officer of the Royal Artillery and Colonel-Commandant Royal Horse Artillery. He died at Woolwich on 26th of January in his 82nd year, sincerely regretted and deeply loved by the corps whose welfare and interest he had so faithfully served throughout his long and distinguished career.

INSTRUMENTS FOR LOOKING THROUGH THICK WALLS WITH SMALL APERTURES.

BY

A. H. RUSSELL, CAPTAIN OF ORDNANCE, U.S. ARMY.

COMMUNICATED BY

THE SECRETARY.

In this paper, where a lens is spoken of, any combination of lenses is meant between two conjugate foci. For instance, the arrangement shown in figure 7 constitutes one lens in the sense in which the term is used, and by such a combination a greater range of vision can be obtained for equal distances between apertures than by a single lens of the same size.

AIMING GUNS THROUGH THICK WALLS OF FORTS AND TURRETS.

The instruments here described afford means of sighting through the thick walls of a fort or gun turret without the use of a wide opening, exposed to shots from the enemy. The outer aperture in the wall may be a mere pinhole or an extremely narrow slit.

Those mentioned in Part I., are purely optical, employing fixed lenses or fixed mirrors; while those in Part II. are mechanical as well as optical, employing parallel plane mirrors, one or both being movable.

The mechanical contrivance allows also modifications which result in a measuring instrument having four times the accuracy of the sextant; while the optical trisection of angles can also be made with ease.

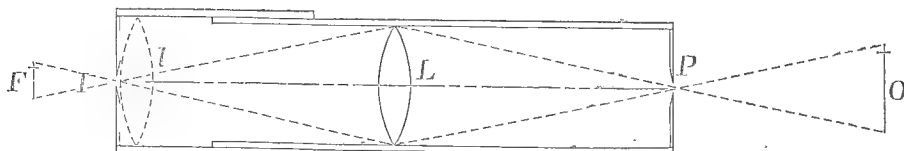
PART I.

Instruments with stationary lenses or mirrors, giving a wide angle of vision through small apertures.

1st. Refracting Instrument.

By setting a lens L (Figure 1) before a thin diaphragm having a

FIG. 1.

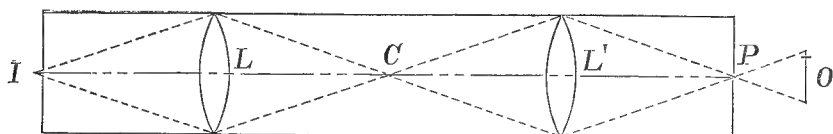


pinhole perforation P , and placing the eye at the point I where rays

from P come to a focus, the observer will be able to see objects, as at O beyond the hole P .

The image appears inverted, but by using two lenses, L and L' as indicated in figure 2, the image appears erect.

FIG. 2.



Sometimes assistance is derived from placing a second lens, shown in dotted lines in figure 1, close to the eye, and it is more convenient for adjusting the position of the eye to have a diaphragm at the eye end with a small hole near the focus I .

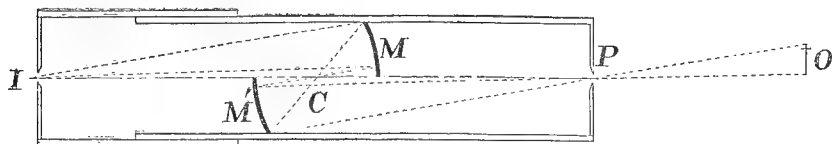
The eye-piece can be moved back and forth to focus the image of P on the point I for any position of L . If I is then nearer to L than P is, the object O will appear magnified.

The observer has his eye in the image of the outer pinhole, and therefore looks through it freely.

2nd. Reflecting Instrument.

Two mirrors M and M' , figure 3, are substituted for the one lens L

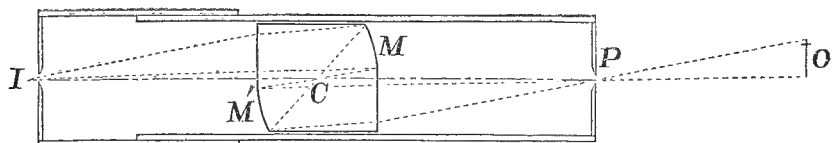
FIG. 3.



of figure 1. If these mirrors are elliptical, and placed so that the point C (where rays cross) and the point P are foci of the ellipse corresponding to M' , and if the foci of the other ellipse (either equal or unequal to the first) are at the points C and I , the image will doubtless be clearer than with spherical mirrors. Difficulties of construction have interfered with making the mirror instrument.

A single piece of glass silvered at M and M' might be substituted for the two mirrors, as shown in figure 4. The refractions at the two plane surfaces would compensate each other.

FIG. 4.

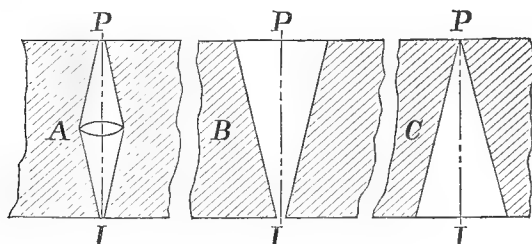


Such instruments give the means of looking through thick walls, as on the turret of an armoured ship or fort, and of obtaining a wide field

of vision without having a large opening in the front face exposed to fire.

Figure 5 shows at *A* the horizontal section of such a wall. At *B*

FIG. 5.

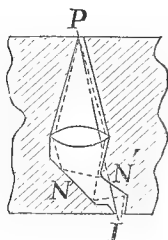


and *C* are shown sections of usual construction, with the peep-hole flaring towards the enemy, or the reverse, the latter construction requiring the observer to keep moving his eye from point to point for observation.

With the instrument described the same effect is obtained without moving the eye.

Figure 6 shows that with a double reflection of the rays by two

FIG. 6.



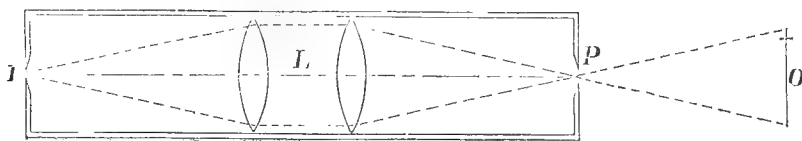
additional, stationary, plane mirrors, *N* and *N'*, the eye can be protected from shots through the outer opening.

The same arrangement would allow of sending a divergent beam of light through thick walls from within, without a wide opening in the walls.

Such an arrangement could be used also for making enlarged images in the pinhole camera-obscura without great increase of depth. By placing a "dark box" inside the wall of a turret, the image of a sight outside could be made to coincide with the image of the target, seen erect as at *F* in figure 1.

Use might be made of the telescope for inspecting the bore of cannon, and also whenever the observer needs to remain concealed from view.

FIG. 7.



PART II.

Mechanical devices for obtaining an extended view through a small hole or slit by means of two parallel plane mirrors.

FIRST FORM.

Two plane mirrors, M and M' (figures 1 and 2) are placed on a

FIG. 1.

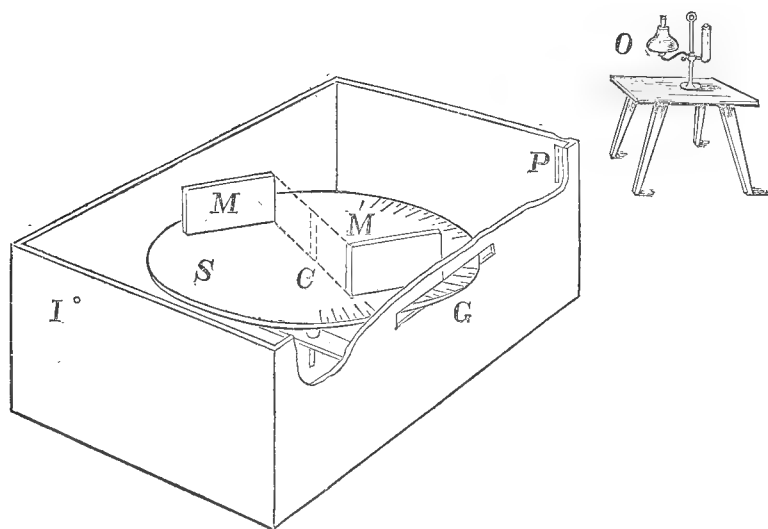
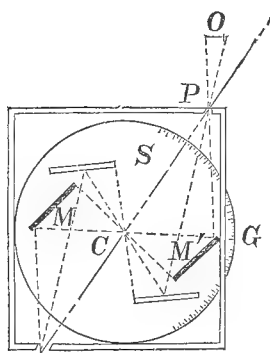


FIG. 2.



revolving plate S and perpendicular to it.

They are at equal distances from the centre C , and placed symmetrically with reference to it at opposite ends and sides of the diameter perpendicular to them.

As the mirrors revolve, the rays from the object at O cross at the aperture slit at P , and are successively reflected to the eye at I for different positions of the mirrors, P and I being in line with the point C and at equal distances from it. A round hole will answer at I .

All the rays which reach I must evidently pass over the point C .

Revolving the plate rapidly gives a continuous image within the range of the instrument.

Part of the side of the box shown in this figure is cut away to show the shaft on which the plate revolves. It can project below the box, to be turned by hand, or it can be revolved by a small electric engine or other mechanical contrivance. The space over the centre of the plate should be unobstructed.

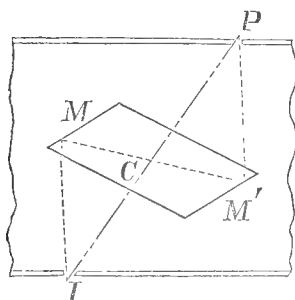
If a diaphragm perpendicular to the two mirrors is set up between them, having a slit over the axis, the walls for apertures *P* and *I* may be dispensed with. The eye may then be placed at any distance from the axis for observation. The position of the diaphragm is indicated in dotted lines in the perspective view, figure 1.

Figure 2 represents the device in plan. The course of the rays is shown in broken lines. A second position of the mirrors is shown in outline. The broken and dotted line shows the course of direct vision through the apertures.

With this arrangement of mirrors the apparent horizontal size of the object seen from *I* is the same as if the eye were at *P*.

A revolving prism, silvered at *M* and *M'* (figure 3), might be substi-

FIG. 3.

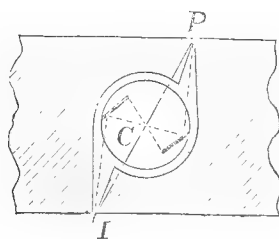


tuted for the mirrors. The cross-section of the prism would be a parallelogram, and the refractions at the two unsilvered surfaces would compensate each other.

This contrivance also allows observation through thick walls, with but a small aperture in the front face, but the wall will have to be hollowed out more than for the instrument with fixed mirrors or lenses.

Figure 4, representing a section of the wall, shows that the eye can

FIG. 4.



be readily protected from shots through the outer opening. Compare figures 5 and 6 of Part I.

By having the whole apparatus revolve around the line IP while the mirrors also rotate around the axis C , a round hole might be substituted for the slit at P and an "all-round" image be obtained, as with the telescope.

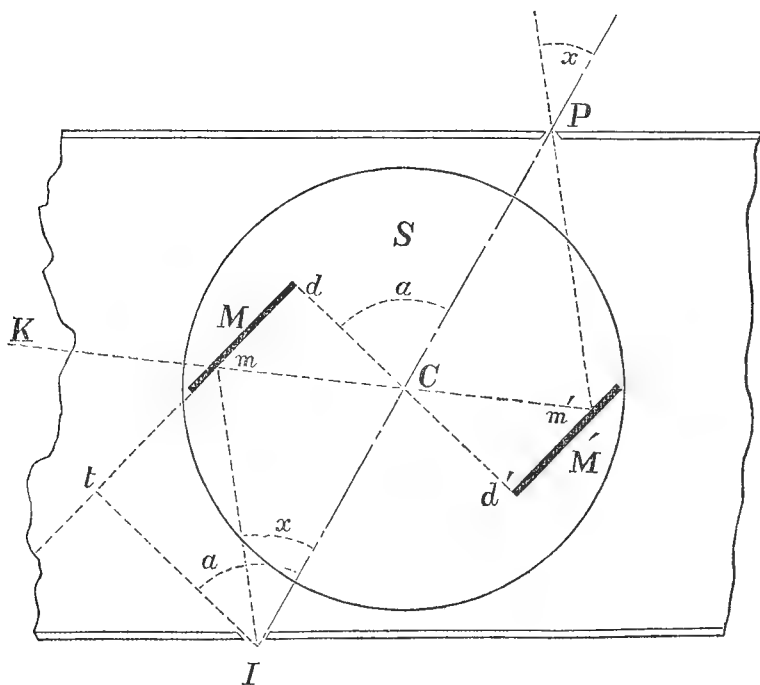
The same arrangement of mirrors can be used for delicate measurement of angles, and by its use an angle can be trisected optically in the field.

When the instrument is used for measuring angles, a large aperture with cross-hairs at the point P can be substituted for the slit.

1st. Use of Instrument for delicate measurement of angles.

If the line IP (in figure 5) is set in any direction, the mirrors can

FIG. 5.



be turned to view an object in some other direction, and the angle between the two lines of direction will be less than the angular displacement of the mirrors from positions perpendicular to the line IP , where the image coincides in direction with the line of direct vision through the slits.

Let R represent $CI = CP$, and r represent $Cd = Cd'$.

Let a represent the angular displacement PCd of the mirrors from positions perpendicular to PI , and x the angular deviation $PI m$, from the direction IP , of the image seen from I .

The angle $dCm = tIm = a - x$.

The perpendicular distance, $I t$, of I from the mirror M is equal to $R \cos a + r$. The distance $d t$ is equal to $R \sin a$.

$$\tan (a-x) = \frac{m t}{I t} = \frac{d m}{C d} = \frac{d t}{I t + C d} = \frac{R \sin a}{R \cos a + 2r}$$

$$\text{Making } n = \frac{R}{r}; \tan (a-x) = \frac{R \sin a}{R \cos a + \frac{2R}{n}} = \frac{\sin a}{\cos a + \frac{2}{n}}$$

$$\text{Therefore, } x = a - \tan^{-1} \frac{\sin a}{\cos a + \frac{2}{n}}.$$

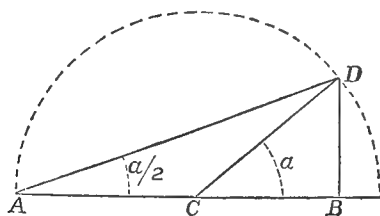
If $n = 2$;

$$\tan (a-x) = \frac{\sin a}{\cos a + 1} = \tan \frac{1}{2} a. \quad (\text{See note below}).$$

Therefore, $d C m = a - x = \frac{1}{2} a = x$, or $a = 2x$.

Note.—Illustration of trigonometrical relation between the sine of an angle and the tangent of half the angle (figure 6)

FIG. 6.



$$\left. \begin{array}{l} AC = 1, \sin a = DB \\ \cos a = CB \\ DAB = \frac{1}{2} a \end{array} \right\} \tan \left(\frac{a}{2} \right) = \frac{DB}{1 + CB} = \frac{\sin a}{1 + \cos a}.$$

Hence, if the distance of the apertures from the axis is twice the distance of the mirrors from the axis, the angular displacement of the mirrors is twice the angle measured, instead of half of it as in other reflecting instruments, and this gives four times the precision of observation obtained by the ordinary sextant.

Other ratios of r and R apparently give varying relations between a and x as a increases, and this would make it difficult to graduate the instrument except for the above proportions.

At G in figure 1, graduations are shown on the edge of the plate S , which is made to project through the side of the box. A mark on the side indicates the proper reading, the scale being so placed that it reads zero when the mirrors are perpendicular to the line joining the apertures.

MAXIMUM LIMIT OF ANGLE MEASURED WITH REVOLVING MIRRORS.

The plane of the mirror, in revolving, passes the aperture when $\cos a = \left(\frac{-r}{R} \right) = -\frac{1}{n}$ and the mirror may reach a distance R from the centre C ; that is, to the slit. In this case when $n=2$; $\cos a = -\frac{1}{2}$, $a=120^\circ$; and $x=60^\circ$.

If the mirror is shorter, the reflections cease sooner, and assuming the mirror to be equal in length to $r = \frac{1}{2} R$, the limit would be reached for $a = 90^\circ$, $x = 45^\circ$. The mirrors will here be parallel to the line IP , when the point of reflection reaches their outer edges.

If n is greater than 2, the maximum deviation will be less; and if n is less than 2 the maximum deviation will be greater, to a certain limit of the value of n , dependent on the length of mirror that can be used.

For the measuring instrument, the value of $n = 2$ need alone be considered.

For use in a turret for obtaining a wide angle of vision, the extent would be limited by the cavity that could be allowed for the apparatus leaving strength enough to the wall. (See figure 4). Fifteen to twenty degrees might probably be obtained.

2nd. Trisection of an angle with the instrument.

$$PCm = a + d \quad Cm = a + (a - x) = 2a - x$$

When $n = 2$, $x = \frac{1}{2} a = d \quad Cm$,

Therefore, $PCm = 3x = 3 \times (d \quad Cm)$.

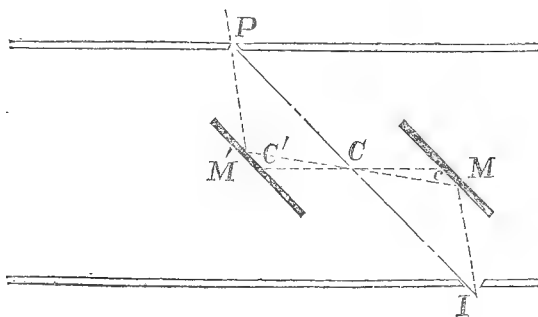
Hence, if an observer at C lays off any angle PCK , and turns the mirrors until he sees the reflection of I from the direction of K , the angle x will be one third the angle PCK , and this can be laid off from the direction CK by sighting from C along the line Cd perpendicular to the mirror. For this process, but one mirror is needed.

With two mirrors this angle can be laid off from the direction IP , by sighting from I along the line Im , when the change of position from C to I will not be appreciable in comparison with the distance of objects sighted on.

SECOND FORM.

Two plane mirrors M and M' (figure 7) are made to revolve about

FIG. 7.



separate centres, C and C' , but keep always parallel. If P and I are at equal distances from C , midway between the centres of revolution, the rays from P reflected to I will cross at C .

This arrangement would answer, like the first method, either for obtaining a continuous image, or for measurement, but the exact values of the deviation for different inclinations of the mirrors to the line IP have not been worked out.

THIRD FORM.

In this, one mirror M' is fixed, and the second one is movable, the latter remaining, as before, always parallel to the former. See figures 8 and 9.

FIG. 8.

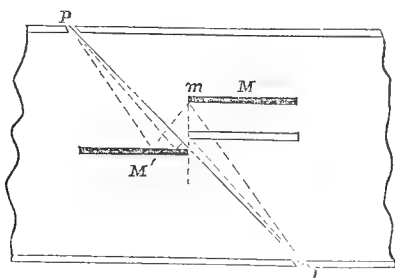
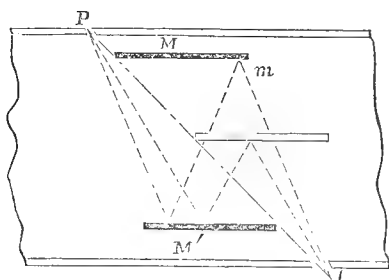


FIG. 9.



In figure 8 the motion of the mirror M is perpendicular to itself, and in figure 9 it is on a line inclined to its face, the inclination, however not exceeding that of the line IP to the mirrors. A second position of the movable mirror is shown in outline. The mirror oscillates back and forth from a position continuous with the fixed mirror.

By having a succession of movable parallel mirrors their motion can be made continuous instead of oscillating, giving greater uniformity of illumination to the image.

When the fixed mirror is midway between the apertures, the point of reflection on the movable mirror will be constant, and its position will be in a line passing through the middle of the line PI , and perpendicular to the mirrors.

AN ACCOUNT
OF THE
RELIEF OF CHITRAL FORT FROM GILGIT
AND
THE SIEGE OF CHITRAL.
BY
LIEUTENANT C. G. STEWART, R.A.

INTRODUCTION.

It will interest readers of the following article to note that the special correspondent of the *Times* writing from Camp Dir on May 6, 1895 says:—

At Gupis, 65 miles from Gilgit, where there is a small fort, built last year by the Government of India as an advance post in the direction of Chitral, Lieutenant Stewart, R.A. was picked up (on Colonel Kelly's march) to take command of the two guns brought from Gilgit. This, as it proved, was a most valuable addition to the force, for Lieutenant Stewart is not only a highly scientific artilleryman and one who took the highest places in professional examinations, but also a man of unbounded energy and determination.—*A.J.A.*

On January 5th, 1895 the first news reached Gilgit of the murder of the Mehtar Nizam-ul-Mulk of Chitral by his brother Amir-ul-Mulk. Lieutenant Gurdon, Political officer, was then in Chitral with 8 men of 14th Sikhs. 50 men 14th Sikhs were at once ordered to join him from Mastuj under Soubadar Gurmukh Singh. This they did forthwith. Mr. Robertson, c.s.i., British Agent at Gilgit, arrived at Chitral on 31st January with 40 rifles 14th Sikhs under Lieutenant Harley, and 100 rifles of 4th Kashmir Imperial Infantry, with Captains Campbell and Townshend. 100 men 4th Kashmir Rifles followed on 2nd February, and on 20th February Captain Baird reinforced Chitral with another 100 men of 4th Kashmir Rifles. The garrison occupied the fort and numbered:—

100 rifles 14th Sikhs under Lieutenant Harley.

300 rifles 4th Kashmir Rifles, with Captains Campbell, Townshend and Baird.

On March 3rd Chitral fort was surrounded, and all communication ceased with Gilgit. Lieutenants Fowler, R.E. and Edwardes, Indian

Staff Corps left Mastuj with some 60 men with a convoy of ammunition to open up communications. They were surrounded in a house in Réshan, and fought desparately for 7 days, having to make sorties for water; Lieutenant Fowler was wounded. The enemy then told them peace had been arranged, sent them provisions, and two or three days later invited them to see a game of polo. The officers, probably fearing to jeopardise the only chance of escape of their party, accepted. On a signal from Mahomed Isa, the leader of the Chitralis in Réshan, they were set on suddenly, taken prisoners with the escort they had brought, and bound. The house in which their party was, was rushed, and all sepoys not Mahomedans murdered in cold blood.

Early in March Lieutenant Moberley, D.S.O., Political officer at Mastuj, having heard some disquieting rumours, arranged for Captain Ross, with Lieutenant Jones and 100 rifles 14th Sikhs, to leave Mastuj and reinforce Lieutenant Fowler; he proceeded as far as Buni, some 17 miles from Mastuj, left a party of 40 men there, intending to make a dash to reach Fowler and Edwardes, and return with them. On the way he was set on in a defile by men rolling stones down the mountain sides from a height of 2,000 ft., lost many men and tried to return; his retreat over the river was cut by the bridge being broken, and a long line of stone entrenchments (sangars), opened fire on them; the survivors reached some caves in the hills, and remained there two nights and days; an attempt was made to scale the mountains, and turn out the enemy, but a precipice was reached and return became necessary, one man being killed by falling in the attempt to scale the precipice. The only alternative now left was for the party to cut their way back at any cost. This was done, but only Lieutenant Jones and 14 men, of whom 10 were wounded, got through to Buni. Captain Ross was shot through the head, storming a sangar, after he had killed several of the enemy himself. Lieutenant Jones and his men rejoined their 40 men in Buni, and resisted successfully till Lieutenant Moberly relieved them 6 days later with 150 men from Mastuj. He escorted them, followed by enemy in large numbers to Mastuj, having done 34 miles over a mountain road without halting, his men carrying their kits and 120 rounds each. Mastuj was surrounded on March 22nd and all communication ceased with Gilgit and Chitral.

On March 22nd, great alarm being felt in Gilgit at non-receipt of any post from Chitral, a column was collected at Gilgit under command of Colonel Kelly, 32nd Pioncers, consisting of 400 rifles 32nd Pioneers under Captain Borradaile, and 2 guns No. 1 Kashmir Mountain Battery under Lieutenant Stewart, R.A. Colonel Kelly's orders were to advance towards Chitral, and if possible relieve it and Mastuj. We arrived at Ghizar, about 120 miles from Gilgit on 31st March. Here our difficulties began, there being a hitch as to transport, and Ghizar being at an elevation of 10,000 feet, snow was lying about 8 inches deep. The road from Ghizar lies for 13 miles along the Ghizar valley, over more or less level ground to Langar, which is at the Gilgit side of the Shandour Pass. The road rises here gradually for some 4 miles to the Shandour lake, 12,500 feet, passes over the lake at this season of the year, and descends rapidly some 5 miles

on to Laspur, a large village at an elevation of 10,000 feet.

On leaving Ghizar on 1st April the column proceeded for about 5 miles, when deep snow was encountered, so that the battery mules and transport ponies went in over their shoulders, and it was found impossible to proceed with them, even unloaded. The column returned, 200 Pioneers with all cooly transport were left at Tera, a small village 3 miles from Ghizar, with orders to proceed when possible. The remainder returned to Ghizar. On 2nd April heavy snow fell. Sledges and toboggans were made and tried for guns and ammunition in Ghizar, and appeared to answer fairly well. On 3rd April the guns joined the Pioneers at Tera, and proceeded as far as the mules could go, all Battery men carrying their own kits. They were then placed on the sledges. It had now however become very hot, the track made was not broad enough for the sledges, and snow was soft. The labour of dragging was excessive so the guns and ammunition were slung on poles and carried by gunners and sepoy. Owing to deep snow and the narrow track this was most arduous work, as when a man's foot got off the track, he went in up to his waist. We proceeded at about half mile an hour till 8.30 p.m., when we were about 3 miles from Langar; here darkness came on, men could not see where to place their feet, and were utterly done. All loads were stacked in the snow, upright poles being left to mark the spot in case of more snow falling, which appeared likely. The last men got into camp at 11 p.m., and had to bivouac on the snow with a bitter wind, and severe cold, no tents having been brought from Gilgit. The next day, the 200 Pioneers under Captain Borradaile crossed the pass to Laspur, which they reached with great difficulty at 7.30 p.m. The gunners and 50 men of the 4th Kashmir Rifles, and 38 coolies returned to fetch the guns and ammunition, which reached Langar by 4 p.m. and the men bivouacked again. At 6 a.m. on 5th April, the guns started over the pass, 40 relief coolies met us half way, and the guns arrived in Laspur at 4.30 p.m., nearly all the men being snow blind, and very done up. On 6th April, a reconnaissance took place 10 miles down Mastuj valley and back, guns being carried by coolies. The enemy were discovered in position at Chakalwat. On 7th April, troops halted to recruit and Colonel Kelly joined us. On 8th April, the force moved to Gusht 2 miles from Chakalwat and 8 miles from Mastuj. The enemy were observed strengthening their sangars. They were attacked on 9th April, and driven out after an hour's fighting, losing some 20 or so killed. The column marched into Mastuj, which had been shut up for 18 days, but was all correct.

200 more Pioneers joined here on 11th April, and the gun, carriage and wheel saddles having been got over the pass, the guns and ammunition were packed on country ponies about 13 hands high which seemed to act fairly well. On 13th April, the column consisting now of 400 Pioneers, 2 guns, 100 4th Kashmir Rifles, 40 Kashmir Sappers and Miners and 150 levies advanced to attack the enemy at Nisha Gol, a very strong position, on the far side of a deep precipitous nullah. The enemy had a line of sangars along the far edge of nullah right across the valley with sangars at intervals up the steep

mountains on either side into the snows, and occupied, as far as we could guess, by some 2,000 men. The nullah above mentioned bisected a large, undulating, fan-shaped delta, inclining up from the Chitral river to a short rugged nullah into the mountains on our right. The cliff over the river was sheer for 200 feet and into the water course of the nullah for 250 to 300 feet.

The only way of crossing the nullah appeared by the road, which had been cut away on either side of the nullah, and was blocked on the far side by some large sangars occupied by about 1,000 men. On the other side of the river, precipices rose which were quite impassable and studded with many sangars.

The column having advanced by right bank of river, debouched into the plain and deployed to attack enemy's left. The guns came into action at 500 yards, the first point from which the lower sangar was visible. After this was silenced, the guns advanced to within 150 yards of the large sangar, a most formidable one. This was necessary owing to undulating ground but it had luckily been evacuated. The guns came into action at 275 yards on another sangar and fired common shell into it, and just before retiring 2 rounds of case. This sangar also being silenced, the guns retired, and came into action at 1,050 yards, and 850 yards on large sangars on enemy's right. Levies were sent to turn enemy's left flank high up the nullah, the 32nd Pioneers keeping sangar fire down by well directed volleys. Light ladders with ropes were let down into the nullah, and men crossed slowly, there being a goat track up the far side. When the enemy saw that the levies had turned their flank, and sepoys were crossing the nullah, they retired from all their sangars and fled towards Chitral. Volleys were fired at them, and some rounds of shrapnel. The main body crossed by the road and bivouacked about one mile beyond the scene of action. Our losses were 6 killed and 16 wounded, of which the guns lost 3 killed and 3 wounded. The enemy were seen carrying away their dead and wounded; we found some 20 dead, and computed their losses at 50 killed and 100 wounded; this was more or less confirmed by native intelligence.

The enemy were armed with many Martini and Snider rifles, and had lots of ammunition and made wonderfully good shooting. Had not the ground been undulating, our losses must have been much greater.

The wounded were returned to Mastuj, and on 14th the column marched to Kila Drasan, a most arduous march. There had been a hitch in Commissariat and Transport arrangements beyond Ghizar, the people having fled. The roads and bridges were broken in many places on the road to Chitral, and we did not arrive till 20th. The enemy were not again met with, and evacuated Chitral on night of 18th to 19th. We arrived just in time, as the Garrison said they did not think they could have held out another week.

Great credit was due to all ranks for the way they performed this most arduous march; carrying the guns was very hard work. There was only one case of falling out in the section; this was due to severe snow blindness, and altogether there were 30 cases of snow blindness and 26 of frost bite. We were all very pleased in Chitral to receive

two congratulatory telegrams from Sir George White, praising the resolution shewn in getting over the snow and the conduct of the troops in action.

The following account of the siege of Chitral Fort is deduced from notes kindly lent by Captain Campbell, Central India Horse.

Chitral Fort is a square erection, having a high square tower at each corner, made of stone, wood and mud. The walls are about 20 feet the towers from 30 feet to 45 feet high. The fort lies near the river, that is, low down and can be seen into and commanded from all sides. A covered way had been made to reach the river, there being no other water supply. Trees grew quite close up to the walls on three sides, and owing to suddenness of investment, there was no time to cut them down. Although a bad position, the fort was the only place offering a chance of resisting the large numbers of the enemy for any time. A large quantity of grain had been stored, and the men had 300 rounds per rifle.

On Sunday, 3rd March, news was received that Sher Afzul with a numerous following had arrived at the southern extremity of Chitral plain, about 4 miles from the fort. Captains Campbell, Townshend and Baird proceeded to make a reconnaissance with 200 Kashmir sepoy. The enemy not showing up in great numbers at first, an attempt was made to dislodge them from a hamlet called Koka Sand. On becoming closely engaged, the enemy appeared in great numbers, and many were seen descending the high hills on our right, whither Captain Baird had been sent with some men.

An attempt was made to clear the village with the bayonet, but failed. Captain Campbell was shot in the knee just prior to the rush, Captain Baird was mortally wounded almost at once, Captain Townshend led the rush on the village, and on either side of him were General Baj Singh and Major Bikhari Singh of the Kashmir Army. These were both shot dead. It appeared impossible to do anything but retire, so the men were placed behind a wall and waited for darkness. At 6.30 p.m. the order to retire by alternate half companies was given. The steadiness of the movement was interfered with by an overwhelming fire from front and flanks. Every bit of cover was made use of to check the enemy, and the troops reached the fort at 7.30 p.m., having lost 22 killed and 34 wounded. The final retirement was covered by 50 men of 14th Sikhs. Surgeon-Captain Whitchurch, I.M.S., had proceeded at once under a very hot fire to assist Captain Baird. He carried him down the hill, and placed him in a dooly, but two of the bearers were at once shot, and Whitchurch with one sepoy, and escorted by four others, carried Baird about half mile till they reached a deep nullah running across the Chitral plain towards the river. They did this under a most severe fire, and three or four times were obliged to place Baird on the ground and with the bayonet clear the enemy from stone walls in their front. On reaching the nullah they found it impossible to proceed straight, and had to make a long detour by the river and under fire, arriving at the fort with nearly every one of the party hit. Captain Baird was again hit quite close to the fort. Surgeon-Captain Whitchurch has been recommended for the Victoria Cross for

this very gallant deed and the sepoy for the Order of Merit. From 3rd March to 19th April the fort was closely invested on all sides by the enemy. They built fascine entrenchments at 40 yards distance, and kept up a fire night and day. They were armed with many breech-loading rifles and lots of ammunition, and the losses in the fort amounted to 17 killed and 30 wounded. The conduct of the 14th Sikhs under Lieutenant Harley was beyond praise, they never got a night off the walls, and the greater the danger became the more cheerful they appeared. The garrison were rationed from 3rd March on 1 lb. of gritty flour only daily, and the only meat obtainable was the officer's ponies. Several attempts were made to fire the fort, one of which fired a tower largely made of wood, and in attempting to put this out the British agent, Mr. Robertson, was severely wounded in left shoulder.

The enemy also mined to within 2 yards of one tower and when this was discovered, on 18th April, Lieutenant Harley with 40 Sikhs and 60 Kashmir sepoy made a brilliant sortie, caught the enemy in the mine, killed 46 of them, and blew in the mine. His party lost 8 killed and 14 wounded.

Great preparations had been made for a grand assault on 19th April, but the enemy fled on the approach of the Gilgit column on the night of the 18th to 19th. The whole garrison were never off the walls at night, and endured their privations cheerfully. The bhisties should not be forgotten ; two of them were killed and one wounded.

DIARY
OF
LIEUTENANT W. SWABEY, R.H.A., IN THE
PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 310, No. 6, Vol. XXII.).

PART II.

CHAPTER III.

"D" Troop march to the North. Bull-fights. Truxillo. Cordial reception on the march. Toledo. Aranjuez.

30th August.—Our destination appears now pretty certainly northward by Medellin.¹

The infantry in our rear passed us to-day and marched to Campillo, thereby turning us, who were the advance, into the rear guard, as we are now marching away from the enemy.

The news of Colonel Skerrett's having taken Seville and of the raising of the siege of Cadiz is confirmed. d'Erlon's corps is to-day at Cordova forming a rear guard to the concentrated force of Soult, who it appears is bending his course to Valencia if not La Mancha.

31st August.—Rode out to Azuaga, which we were attracted to visit by its always having been the point to which the French head-quarters went when we were in this district. There are some fine specimens of the early mixture of Moorish and Gothic architecture, and a castle, probably Roman.

The Spanish cavalry were in the place, and to prove the universal passion for bull-fights they had tied one to a stake and were teasing him. We had to pass the street and it was agreed that it would not look well for English officers to turn, though the Spaniards went nowhere within his reach. Our danger consisted in being charged, which in fact we were, by the furious beast, but still more in having our horses thrown down by the cord to which he was fastened. We put spurs to our horses and passed him amidst shouts of *Vivan los Ingleses*.

¹ A glance at maps I. and III. will shew the line of this march. From Berlanga *via* Maguilla to Medellin. At that place cross the Guadiana, and then by Truxillo and Javaicejo to Almaraz, then cross the Tagus and by the right bank to Talavera. Then recrossing that river, by Toledo to the neighbourhood of Aranjuez.—*F.A.W.*

d'Erlon's head-quarters were at Cordova yesterday, he having joined Soult. Seville is certainly taken by Skerrett and the siege of Cadiz raised.

On August 27th, an attack was made by the allies under General La Crux on the enemy's rear guard at Seville, in which attack the allied British and Portuguese troops under Colonel Skerrett distinguished themselves. The bridge of Seville was thereby saved, and the enemy prevented from destroying many guns and valuable stores which the town contained.—Wellington Despatches, Vol. IX., p. 429.

1st September.—Instead of getting up early to kill partridges, I rose at 4 o'clock and marched to Maguilla where the light brigade was badly accommodated. Lallemand made this a favourite post at which I am not surprised as it is very well protected by ravines against any sudden attack.

2nd September.—We marched to Corteja de Frayles the name of two or three cottages about a mile distant from each other, and encamped. The cavalry went to El Campillo, another bad place to which we were ordered by the Quarter-Master-General, but being better informed than he, we learnt the road was impassable and General Long permitted us to go round.

3rd September.—Marched to Zalamca. This place was for 9 months d'Erlon's head-quarters, notwithstanding which the expressions of loyalty and the readiness of the authorities to assist us, were new traits in the Spanish character which in our old track we never met.

4th September.—Remained at Zalamca and there being a castle I went antiquity hunting. With some difficulty I climbed up one of the towers there being no other means of ascent. From its top I had an interesting view of the country and found my map very accurately drawn. I saw Benalcazar, a castle into which last year we made some fruitless attempts to get. It was the magazine of the French in this quarter and they retired with such precipitation that they left quantities of stores.

The news of the day is that at the passage of the Guadalquiver, d'Erlon has thrown some artillery he could not take on into the river. It appears too that General Maitland has been successful against Suchet. The town of Zalamca shows many remains of Moorish building, and part of the castle is decidedly of their constructing. I believe it from situation to have been a valuable town to them.

General Maitland with a Sicilian division of troops under his command landed at Alicante on the 10th of August. With the Spanish troops under Generals Whittingham and Roche he advanced to Elda, but on the approach of the King to join Marshal Suchet he retired to Alicante, where he was directed by Lord Wellington to maintain himself as the place was of importance. He does not appear to have been engaged with the enemy.—See Wellington Despatches, Vol. IX., pp. 265, 360, 389.

5th September.—I remained among the Moorish relics pleased with the change in the manners of the people.

It is remarkable that this is the first time that the English have more than patrolled to this place.

I wrote to Harding and Mr. Walcott.

6th September.—Marched to Campanario into which we were cheered with *vivas* and handkerchiefs. If loyalty existed in Zalamca, here it was most conspicuous.

The structure of the houses is by no means better than hitherto, but worse, for the body of the house is taken up by the passage or kitchen and there is an apartment in the corner to sleep in, without window or air.

7th September.—For the first time we experienced the civility of Spaniards in the very rarely shown form of a bottle of wine and a melon being placed on the table, which seldom shows itself in that way; there was likewise a dish of stewed pork which being seasoned with garlic and oil, I could not find politeness enough to eat. Some of us not being quite so delicate saved us from the dilemma of sending it out untouched.

To my great disappointment we halted here to-day, for in my mind I had already overtaken, killed, and eaten *Le pauvre Monsieur Soult*.

8th September.—This evening a bull-fight was given in honour of our highnesses. There is no regular *Plaza de Toros* but all the avenues leading to the square being closed and secured the animals were baited there.

I have no right to form an opinion from a "rustic feast" (for they still preserve the title the Romans gave to their sports), but certainly this afforded little amusement, and gave few specimens of courage and address.

The nature of the thing consisted in a savage bull being let loose in an enclosure, the people goading him with long sticks headed with iron and still more by a noise peculiar to this sport by which they irritate him. He fixes his eye occasionally with astonishing quickness and charges one of his cruel tormentors. In the height of his career, a cloak, hat, or handkerchief turns his attention, so that when well played the grand art is to have a cloth, allow the bull to charge, and merely throw it on one side at his approach, when his butt will invariably be directed at it and the *Torero* or Bull-fighter escapes. It is remarkable that when he gets a blow at a man he aims with the middle of his forehead and seems quite ignorant of the use of his horns, so that several English as well as Spaniards who were the boldest in the ring were thrown down, but were invariably unhurt by the horns. When he gets a man down he begins to poke sideways and is then dangerous; it is then that courage is conspicuous for there were some who ran out to rescue and literally pinned the animal by catching fast hold of the horns behind his head. This several English as well as Spaniards performed with uncommon courage.

I can fancy the bull-fight in a regular circus where only a certain number of assistants were admitted, with regular *Toreros* and proper

lances to dart, in place of goading the unfortunate beast, being a sight worthy the admirers of tilt and tournament to which it must bear a great resemblance.

I met to-day with an anecdote worth remembering. Joseph Bonaparte on leaving Madrid sold the books of the Royal Library, a very curious collection, at 4½d. per lb., showing as much respect for literature here as at Salamanca.

9th September.—The bull-fights were continued to-day; without the attraction of novelty they had ceased to please; and having seen the tameness of the sport I ventured inside the barrier, where I felt quite safe though obliged to use my legs frequently.

10th September.—More *Corridas de Toro*, affording us little amusement. I find that the Alcades, or magistrates make requisitions on the people for cars and wood etc. to enclose the arena for this sacred purpose, so much the passion of the Spaniards; that the people who can see the sport from their windows, throw open their houses to all comers, and seem to consent with pleasure to the tiles on the tops being completely ruined.

11th September.—For the first time since the 6th of April, rain fell accompanied with dreadful thunder and lightning, which made old and young cross themselves, but caused with me the greatest demonstration of joy, much to the surprise of some priests who seemed to think purgatory too good for me.

12th September.—More rain and a great change in the air, thunder and lightning still accompanying.

13th September.—To our great satisfaction came a route to Don Benito, a town which the highly coloured epithets of the Spaniards had made me think at least a second London. I was much disappointed. It is however a mart for the few commodities that since the siege of Cadiz find their way to this part of Estremadura.

14th September.—We crossed the Guadiana above Medellin by a ford. I was anxious to see the bridge which is unique, being built in a curve to accommodate (as I consider) its shape to the soil in the bed of the river. The river is fordable almost anywhere above Merida before the rainy season. We reached a miserable town called Miajadas, where part of the infantry column treated us as usual very illiberally in the distribution of the town. Part of our march was in the rain.

15th September.—Marched in the rain to La Puerta de S^{ta} Cruz, and after a long quarrel with an infantry Brigade-Major, I succeeded in getting some quarters; nothing is so much against cavalry as being quartered with infantry. Perhaps in the house with one horse are 30 men, who never let him rest or feed, and all the infantry staff take a pleasure in mortifying and rendering the cavalry ineffective.

Near this place is an immense hermitage and some aqueducts, which the bad weather, and even more the difficulty of quartering the men, prevented me from seeing.

16th September.—Marched still in the rain to Truxillo. On arriving there, though it is a large town, the Quarter-Master-General of the

2nd division (not General Hill's Quarter-Master-General who would have known better), gave us no division of the town. I think I never was in such a rage in my life.

17th September.—I employed myself in examining the remains of this famous city, once the seat of all the nobility of Estremadura, all whose palaces are now destroyed by the French.

The first object of my search was the tomb of Pizarro, which stands in a chapel belonging to his family in the castle church; it was robbed by the French who bore the relics to France. These artful conquerors know that the first blow to conquer the spirit of a people, is to destroy all the monuments of traditionary greatness that have been used to inspire them with a desire of emulating the deeds of their ancestry.

There are two houses of a superior style of grandeur in the square which they tell you both belonged to their admired hero, one before his conquests, the other built by him after his fame was established. I did not credit their accounts as I detected the difference in the coats of arms by which they were adorned. One indeed might have been Pizarro's being covered with trophies, amongst others, captive kings with chains about their necks.

In the city church was a striking monument to the memory of a hero whose name was defaced, who had fallen in the wars with the Moors, date 1530, this story, which is that of a priest, is incorrect. The Moors were expelled in the 15th century.¹

The castle, containing six convents now destroyed by the French, is built on an high rock, and was evidently constructed on Moorish ruins. One of the convents I examined most minutely all over, and was able to trace through its apartments the habits of the unfortunate victims of superstition. Underground dungeons and places for solitary penance, secret stairs and various chapels were numerous, well selected religious texts were inscribed on the walls, with a separate cell for every nun. Bats and owls and every inhabitant but comfort seemed to have taken refuge there from the world, the approach to even a view of which, was on one side obstructed by a rocky precipice, and on the other by the castle wall.

I had only time to examine one of the six convents, the inhabitants of which are now crowded into one house, and having been robbed of all their riches and endowments, subsist precariously by the sale of stockings and other work; they indeed kept a pastry cook's shop during our stay, but I could not indulge myself in being a purchaser, or enquiring into their history for want of money.

Truxillo has some fine houses in the square and castle which have singularly ornamented windows, cut in the angles in the form of segments of circles, and having a very pleasing appearance.

There is more here of the grandeur of antiquity which you look for amongst these proud people than I have seen before. All the *Hidalgos* have fled to Cadiz, and the Spaniards at the coming of the French, having deserted all the country this side of the Tagus; the towns we have since passed are nearly destroyed.

¹ The Moors were expelled from Spain in 1492.

18th September.—My time amply employed in antiquity hunting. In the church I found the tomb of Paredes,¹ said by Michael Cervantes to have been the strongest man in Spain, and a priest showed me an immense font which he presented to his mother in one hand, at the door of the church, she having left it without crossing herself with holy water.

I need not add that to read the epitaph on his tomb describing him as a church benefactor was useless after the priest's story.

La Borde² says that according to Spanish writers, Truxillo was in existence before the dominion of the Romans under the name of Sealabis; according to Pliny, Castra Julia; *Les gens du pays attribuent sa fondation à Hercule*. It changed masters frequently in the Moorish wars. Paredes (mentioned in my journal) returning from wars against the Turks died at Boulogne and his body was carried 15 years after to Truxillo, which history the defaced state of the inscription on his tomb prevented my understanding at the time, though I call it perfectly to mind from the little that was intelligible. The story about his strength I had from a priest.

This church of Santa Maria I remember to be an addition to a tower of considerable date, which La Borde says is supposed to be Turris Julia and built by Julius Cæsar, I do not think it likely that the Romans would have built a tower where only part and one side of the surrounding country can be seen from it, when so many situations were at hand that would have answered the purpose better; and again the register of the town (still preserved, but probably containing many improbable traditions) speaks of the castle which is higher, as the most ancient building of the city. It would be impossible to say who built this castle, as from its singular construction adapted to the shape of the rock, out of which its walls are hewn and blasted, there is no trace of any particular system of building. The castle so constructed within the walls is doubtless Roman, so that the tower of the church can hardly be so too, and I look upon it as a Spanish church grafted on a Moorish ruin, as indeed are many of the houses in the square. The construction both as to date and architecture being very evident, and in some of the more recently built, the Spaniards have evidently copied the Moorish ornaments, perhaps that they might not destroy the architectural uniformity; at the same time they have afforded by an inevitable contrast a lasting proof of the Moorish superiority.

I wonder La Borde has overlooked Pizarro's tomb, as he wrote just before his countrymen had removed his bones, and done their best to destroy the castles and convents.

As an instance of the rascality and treason of some of the civil authorities, I need only instance the following case: six pieces of French artillery were found here concealed under some wood; that the Alcade might not be taken by surprise, a note intimating that it was

¹ Garcia de Paredes, the Spanish Sampson.—*F.A.W.*

² Jean Benjamin La Borde was a French writer on history, geography, chronology, and music. He wrote "*Itineraire descriptive de L'Espagne*," a useful guide-book to that country. La Borde who had been the *premier valet de chambre* to Louis the XV., and after his death one of the *Faners General*, was guillotined during the French Revolution, July 22nd, 1794.—*Encyclopædia Britannica*.

reported there were some was written to him, to which he replied positively denying there were any, though he himself had provided transport to bring them from Almaraz. I wish I had the hanging of him as an example.

19th September.—Marched to Javaicejo a place totally destroyed; no forage to be had, and nothing but the barren face of a deserted country to be seen.

20th September.—To-day we crossed the mountains overhanging the Tagus through the truly grand pass of Miravete. A fort and the castle of Miravete command the approach. The fort was destroyed by General Hill, when he took the works at Almaraz, and the castle and depôt subsequently were dismantled by the enemy. The road, the work of Engineers, descends in a zig-zag to the river, the passage of which is defended first by the famous fort Napoleon, constructed by the French and stormed in the summer by General Hill. On examining it I did not think the exploit deserved the fame it acquired; it is ready for the Spaniards. On the opposite side is fort Ragusa commanded by Napoleon on which Lieutenant Love, R.A., very judiciously turned the guns.

The pontoon bridge had been laid the day before for our reception. As it was necessary to take our horses out to cross, General Howard, much to his disgrace, ordered us to halt and put the infantry over first notwithstanding the representation of Colonel Tulloch, who had orders to press one of his brigades of Portuguese artillery on to Talavera. General Howard was not satisfied with this arbitrary unmilitary proceeding, but even ordered the baggage (which took two hours to pass the bridge) over before us, which delayed us till it was near dark and we got to Saucedilla a ruined village by 8 o'clock having no forage. General Howard will be surprised to find his conduct reported to General Hill.

21st September.—Found ourselves as soon as it was light in a valley full of towns, once populous but now dismantled, and their fields uncultivated; we had indeed to our satisfaction joined General Slade, being heartily sick of the infantry, whom I never wish again to see except in the field of battle.

With great difficulty one day's forage was raised.

22nd September.—To-day partly from curiosity and partly on duty I rode to look for forage. Nothing can exceed the desolation that reigns in this once fertile region. The mountains which skirt the edges of the valleys, formerly looked at with admiration because of their rude uncultivated tops, now present the only object of cultivation, being hung with vineyards, at this season luxuriant and beautiful, and wherever there remains a roof in the neighbourhood it covers a wine-press; all these inhabited places could only produce one day's hay for the cattle.

23rd September.—Still in the regions of desolation and want, there being, however, a remnant of population in a village near, I was sent to reconnoitre it with a view of removing there. I was sorry to find none of the requisites for forage so necessary to us, for a more romantic hamlet I never beheld. I use the expression hamlet, because it was so

truly like an English village embosomed in woods and deeply secluded in a beautiful valley. It almost seems to have escaped the notice of the savage Marmont, as if bearing a semblance to our land of liberty, there was a spell that protected it.

24th September.—This tract of country owed its ruin to the battle of Talavera. After the French advanced from thence they spared nothing that came in their way, and as we now draw all our supplies from the country, we sent to-day as far as Plasencia for corn; and the prospect of want was so great that Lefebure wrote to represent the barrenness of our cantonments.

25th September.—A route to Calsada de Oropesa, six leagues of a tolerable pull. I went on to search for quarters and took care that a requisition I made for a day's corn and bread was complied with, not without some wry faces from the Alcalde. Our friend Captain Thorn being Quarter-Master-General at this place, he took good care we should have no occasion to boast of our quarters. We shall to-morrow leave the clutches of these infantry harpies, whom I hope never to see again till the day of battle. We passed on our road Oropesa, where is a beautiful and perfect Moorish castle, the property of the Knights of Oropesa, an order that was established after some heroic achievement performed at this place by the Spaniards against the Moors, but which is now like all other monuments of their chivalry, little attended to, though the order is not extinct.

This order like many others of the Spanish military ones, is now embodied with the Knights of Calatrava.¹ During the struggle against the Moors, in conjunction with others they supported armies, and finding them generally serving with the troops of the Bishop of Plasencia, I conclude this country was the scene of action. La Borde does not mention the castle.

26th September.—After a march of eight leagues through a devastated country, we arrived at Talavera de la Reyna, famous for the action fought there. That was a memorable day for the British army, for they only were attacked though the Spanish force was in position; the French had at least 40,000 men and Sir Arthur Wellesley but 18,000. Owing to the length of the march I had only time to take a distant view of the position. I examined the principal height which was attacked and carried by the enemy, but retaken by General Hill's brigade.

The city of Talavera de la Reyna is larger, better built, and has more trade than any I have yet met with, the bridge over the Tagus, destroyed by Cuesta² is a fine ruin and is so repaired as to be passable, one arch only being cut away.

¹ Knights of Calatrava, a Spanish military order, instituted by Sancho III. King of Spain, about the year 1157 A.D., to commemorate the gallant defence of the city of Calatrava against the Moors. The statutes of the order, framed by the chapter-general of the Cistercian monks, were sanctioned by the Bishop of Toledo in 1164, and afterwards by the Pope.—Chambers' Encyclopædia.

² General Don Gregorio Cuesta, commanded the Spanish armies associated with Wellington in the earlier part of the Peninsular War, he resigned the command in August 1809, in consequence of a paralytic stroke which deprived him of the use of his left leg.—See Wellington's Despatches, Vol. V., p. 42.

The battle of Talavera was fought on 28th July, 1809. The allies under Lieut.-General Sir A. Wellesley and General Cuesta, the French under King Joseph Bonaparte.

"The victory of Talavera was in reality won by the British troops which did not number more than 22,000 men of all ranks. The Spaniards, nearly equal in number, were worse than useless, as thousands of them fled without attempting to fight, and spread the news of defeat miles and miles in the rear. The victory, dearly gained by the loss of 6000 of our men killed and wounded, was due to the courage of our own troops, those of Cuesta, which stood their ground, contributing but little to the result. But now came the report that Soult was in force in the allied rear, and that the French, somewhat reinforced were preparing to again advance. Wellesley decided to divide his army and give the choice to Cuesta of remaining to defend Talavera or move against Soult. He chose the former, and promised, if defeated, to rescue the wounded who were crowded there. Wellesley marched in search of Soult. Hardly had he left when news arrived that Cuesta, afraid to fight, had deserted his position and followed the British, leaving 2000 wounded to the mercy of the advancing enemy. Happily they had fallen into the hands of a brave and good man. Victor on reaching Talavera forced the Spaniards to receive the English and French wounded in their houses in equal numbers, and to attend to the English first."—"Wellington" by Lathom Browne, p. 23. Casualties, French 7389, English 5423, Spanish 1200.

27th September.—What shall I, the enemy of Spanish sentiment, and, though not a hopeless actor in the war for Spanish independence, yet totally without trust in Spanish patriotism, say, when I found in passing through a village in a populous and highly cultivated country, where we halted for the sake of water, the people coming out *en masse* to greet us not only with *vivas*, but with pitchers of wine and baskets of grapes, the old in tears and the young mad with exultation.

From this village I was sent dreading the conflict I was to undergo from similar civilities, to mark the cantonments at our destination, Domingo Perez, but I had not expected to be stifled by the embraces of old, young, fair, ugly, man, woman, and child, and to be nearly torn in pieces by every pair of respectable people who were ready to fight for the honour of having me in their houses. The bells rang, the authorities went out to meet the troop, and gratitude, a word I never yet heard sally from the nasty proud habitation of a Spanish mouth, was, they said, the universal debt they were come to pay. The Alcalde, never before accustomed to English soldiers, immediately asked when I would have the meat killed and the rations prepared; a fair indication of what might be done in districts never oppressed by troops moving without a commissariat. We contented ourselves with three days' corn, wine, and bread, with a promise of more to-morrow. After these things were arranged I hoped to have been allowed to be quiet, but

not till midnight would my patron, the Alcalde, or his friends quit me and I heartily wished myself in the wilds of America.

The distance from hence to Madrid is eight leagues, and I mention it as a proof of the indolence, want of curiosity, and consequent lack of information on the part of the Spaniards, that few of the inhabitants had ever been there. As to Domingo Perez itself, it was a perfect specimen of what happy Spain was before the revolution. The houses were neat and comfortable, the inhabitants respectable and cleanly. In the Alcalde's house was a portrait of Lord Wellington, his bust emblematically supported by a figure of Time whose wings were restrained by the genius of Spain. Mercury representing the tutelary deity of England, was presenting him to Minerva and Mars, Hercules was in the group, and the whole was surrounded by a snake, "*la culebra sin fin*"¹ with his tail in his mouth, a very favourite figure in Spanish poetry and emblems intended to represent the imperishable nature of fame.

[It was on the route to Madrid from the country in advance of Badajos by Truxillo, Talavera la Reyna, and Toledo that we now marched. Till we arrived at Aranjuez we had nothing to do with the enemy, and though our march could not be called a triumphal one, it was of a very agreeable nature. We usually marched before daylight, supplies were plentiful, for the most part the country was fertile, and the inhabitants extremely well disposed towards us. It was the season of the vintage, and we had the good fortune to pass through some places where soldiers were actually a novelty, and not unfrequently as we passed did the whole population meet us with pitchers of wine and baskets of grapes. At a small place where we halted for a day called Domingo Perez, these civilities were renewed even to suffocation and the Alcalde insisted on entertaining the officers.

We stayed one day with our hospitable friends, and then proceeded *en route* for Toledo: the kindness however of the inhabitants still pervaded the whole of this district and we fared sumptuously every day, that is in their estimation, but I cannot say that the Spanish cuisine is exactly according to my taste, and when Senor Gil Blas de Santillane boasted of its luxuries he forgot to tell you that at Madrid, and indeed everywhere where there is anything fit to eat, the French method of pandering to the dainty appetite is in vogue. I will leave the Spaniards to settle the dispute as to the authorship of Gil Blas, whether it was truly written by Le Sage, or by a Spaniard, on condition that they will not attempt to set up to be their own cooks.

This reminds me of a very worthy man, gone long ago I trust, to his place of rest, who commanded for some time the particular branch of the service to which I belonged. He was every inch a soldier, neither was he by nature the least inhospitable, but he had an utter contempt for what I will term the amenities of a campaign. With this man I was invited sometimes to dine; good living was not so plentiful the first time I had that honour as to allow me to think with indifference

¹ The endless snake.

upon what might be within reach of his more extended means of cookery than could be looked for at a troop mess, and great was my disappointment, when with little pomp a boiled shoulder of mutton was introduced; whether my hungry countenance betrayed my inward chagrin at this unpromising *entrée* I cannot tell, but I remember well his rubbing his hands with a kind of heroic satisfaction and exclaiming "dinner for a king! dinner for a king!" though there was nothing but a soldier's fare. Whenever I think of him, these words from an inimitable French poem entitled "*Gastronomie*" rush on my mind, "*Si parfois on nous prie*" etc. A soldier's stomach ought always to be ready for coarse and indifferent fare, but it strikes me that an occasional supply of the good things of this life has an incalculably good effect in fitting it for the digestion of a more indifferent selection. I had been very jealous of this officer's adjutant, but I own the shoulder of mutton *bouilli* reconciled me very much to my more humble destiny].

28th September.—Shall I say that I enjoyed the paradise I was in? No. I had here no leisure to write or think, or to enjoy any of the pleasures on which my imagination indulges, the gaiety of the scene only made me melancholy, and I sighed again for the march.

29th September.—We marched to Villamiel, where, if we did not receive so much attention as at Domingo Perez, we were treated with great cordiality, well lodged and readily supplied with corn and bread.

On the road to this place is a long line of Moorish fortifications, better preserved than the remains of Roman camps in England. Its centre is formed by the castle and town of Barciense, the property of the *Dúque del Infantado*. The plan of the fortification is too extensive to be defended in these times without 500,000 men; its right rests on a mountain, and its left on the bridge over the river Guadarrama.

30th September.—We marched to the archiepiscopal city of Toledo, famous for having been the imperial residence of Charles the V. and also of Ferdinand and Isabella, by whose marriage the kingdoms of Castile and Aragon were united,¹ and in whose reign the Moors were finally expelled from the Peninsula, the first step towards the consolidation of the several Gothic Kingdoms of Spain. The Tagus forms a barrier on three sides, and the height on which the city stands is formidable to the approach. On the fourth side it is surrounded by an irregular wall, and though not fortified there are perhaps few open places so well capable of defence; it is the second city in Spain, and was once the first.

1st October.—We happily halted to-day and had leisure to examine the wonders of Toledo. First the famous sword manufactory, the materials for which are now concealed underground and have escaped all the Gallican vigilance. The next object of curiosity is the *alcázar* or palace of Ferdinand and Isabella, famous certainly from the lustre

¹ In the year 1479.

The conquest of the city of Navarre in 1512, by Ferdinand, after the death of Isabella, made him sovereign of Spain from Gibraltar to the Pyrenees.—Chambers' Encyclopædia.

of its inhabitants, for it was likewise the residence of Charles V., but now for the second time a ruin. It was first burnt in the war of Succession by some of Lord Peterborough's Spanish friends, and secondly so completely destroyed by the French, that nothing but the front remains, which, though grand, is certainly no specimen of the taste that is so conspicuous in the churches of this city.

The things that most attracted my attention were two statues with descriptive inscriptions in Spanish, one to a Moorish chief who in 1215, renounced the Moors in the first grand council of Toledo and embraced christianity; the second to San Ildefonso, who is said to have cut a fragment from the garments of Santa Leocadia¹ when she rose from the grave to assist and encourage the exertions made by the Spaniards for their liberty. Strange as it may appear the few here who have any knowledge of antiquity, actually give credit to the tradition, and there is a chapel dedicated to the Santa, raised over the spot where the circumstance took place. The true history is that San Ildefonso greatly distinguished himself against the Moors and certainly dug up and built a chapel over the remains of Santa Leocadia, a Moorish princess, whose charities to the Christian captives were well known. This I was told by a priest, one of those now daily increasing in number whose minds seem to reject all the ridiculous bigotry of Roman Catholic imposition, without any deviation from the tenets of their faith. These will become more numerous now that the new constitution,² ratified and published, has abolished that diabolical Synod, the Inquisition, and given an opening for instruction and liberty of opinion. Its plan is entirely English with a few deviations as to form, and the duration of the Cortes, and the method of election is I think less liable to corruption. On the whole it is a limited monarchy, and is embraced by all with enthusiastic hope, a national failing too well understood and too often the preventative of exertion. The feature of the new law, that which prescribes a system of general education, is novel, at least, unpractised since the Roman and Grecian schools.

We now pass to the Cathedral, in endowments and in ornaments certainly richer than any other in the world. To draw a comparison between it and Westminster Abbey would be misplaced so different are they one from the other. The one at Toledo wants the silent and solitary gloom that bespeaks the mansion of the illustrious dead, in the same proportion that the abbey wants the rich and curious ornaments, the beautiful sculpture and painting that render this the first Cathedral in the world. On entering, it is not so silent and impressive

¹ These two saints are the tutelars of Toledo. Santa Leocadia was cast down from the rocks above the city, on the site of her fall a chapel was raised where councils were held. She is said on one of these occasions to have appeared to the President, San Ildefonso Primate of Toledo (where he died in 617), and told him "her mistress lived through him." San Ildefonso was buried at the feet of Santa Leocadia, his body was carried off at the Moorish invasion, but miraculously discovered in, or about 1720.—Murray's Guide to Spain.

² The constitution promulgated by the Cortes in 1812, was very democratic. It was abrogated by Ferdinand VII. on his return to Spain in 1814, and he then adopted a very reactionary policy. The Monastic orders, the Inquisition, and the rack were restored, and any public impression of liberal opinion vigorously repressed. This resulted in a revolution in 1820, when he was forced to restore the constitution of 1812. This was again overthrown in 1823 through French influence.—Chambers' Encyclopædia.

as the abbey, though on examination it is infinitely more worth seeing, and interested me so much that I even preferred it to my dinner. The architecture is florid Gothic, and the external part is beyond measure beautiful; it has a lofty spire elegantly adorned with a profusion of simple ornamental sculpture. The internal architecture does not attract so much as the beautiful altar-pieces, chapels, choirs, etc., with which it is filled; there is nobody to show the place so that you can only glean a little information from a priest here and there.

The first object of attention are the cloisters, each panel¹ of which is adorned by a large historical painting on the stucco by Francisco Bayeu especially representing the sufferings of Christian captives among the Moors. The St. Cecilia of Spain, so dubbed by my priestly cicerone, a Moorish princess whose charities to the Christians caused her banishment from her father's court, is the principal subject in these paintings; one tradition is beautifully delineated by the painter; it represents her at the moment when accused of assisting the prisoners, and in all the dread of conviction she is obliged to show the bread she has in her apron. By a miracle the bread is turned into flowers which she is showing unconscious of the change. The general effect and high colouring of these remarkable fresco paintings is such that unless the sun be very bright, they are not to be known from those on canvas. The evening is the time to see them in the galleries and chapelries etc., then you find, instead of silent gloom, elegant apartments containing a very excellent collection of paintings of the Italian, Dutch, Spanish and Flemish schools. Generally the subjects are religious, and there is a full-length portrait of St. John which I could have sworn, if it had been cut off at the middle, was stolen from my father at Langley.

The specimens of sculpture are equally admirable, and the finest I ever beheld. These are not lavished on ugly tombs with lengthy epitaphs but form beautiful altar-pieces, etc. The carving of the wooden parts is likewise to be admired and the painting on the ceilings superior. I cannot dismiss the Cathedral without saying that it, as well as the rest of the city, was illuminated at night, and the spire was covered with lamps which had a beautiful effect. The Spanish illuminations generally however only consist of a few lamps, which give an obscure light. There was a ball given by the inhabitants at night in the palace formerly belonging to the Archbishop, who however has now joined the French. Our bands played, and as General Hill wished it we all attended. It is to be noticed there is no supper in these Spanish "let-offs."

The dress and manners of the ladies and their beauty exceeds anything I have before seen in the country, but the nasty waltzyfied country dances made me sigh for English beauty, Humby's Hotel,² and Paddy O'Rafferty. It was curious that I danced with an Irish

¹ These panels, originally painted in frescoes in the style of Giotto, extraordinary and almost unique specimens of art in the 14th century, were unfortunately effaced in 1775, by the Chapter, who employed Francisco Bayeu, a pupil of Velasquez to repaint them about the end of the 18th century, but the cathedral has lost much by the change, the modern tone of the present frescos being out of keeping with their surroundings.—Murray's Guide to Spain.

² An hotel at Christchurch.—F.A.W.

orphan educated in an orphans' college here, who spoke English, French, Italian, and German, all of which we tried, except Italian. The company separated at a late hour. Mr. Townsend¹ did not attend.

[Many who have related their Peninsular adventures have given an account of the ball which was given to General Hill at Toledo, and none have forgotten to paint, however indifferently, the beauty of the Irish refugee sisters of an establishment appropriated for their accommodation which then existed and does still I suppose remain in Toledo. There is a lay as well as an ecclesiastical establishment so that though some of the fair descendants of the Emerald Isle may have taken the veil the greater part are still at liberty to tread the mazy dance and make a weary soldier happy. One of these has been much celebrated not for her beauty only but for the elegance and simplicity with which she spoke several modern languages.

To this fair creature I made several attempts to convey my admiration in set phrases in several modern tongues to her very great amusement, for though I had a share of knowledge of several, yet was I master but of few].

2nd October.—Marched to Villa Minoya, a place neither remarkable for the reception we met with nor the goodness of its houses. It is one of the wine countries of La Mancha and the vintage was going on. The best road from Toledo to Consuegra is by this town and Mansaneque.

3rd October.—Marched as usual at 3 o'clock, two hours before daylight to Mansaneque, a place where we met with every demonstration of joy, and as the Spaniards have so few methods of showing their regard, I will state that in this place they offered us chocolate etc., and dinner, but the warmth of the Domingo Perez people was wanting. Near this is Almonacid where the foolish people fought with the French. It is singular that common sense could not teach them that a plain was the very worst place to fight brave troops.

This is their common practice, their insufferable arrogance makes them imagine themselves brave enough to fight anywhere, and as soon as the enemy shows himself they run away, and boast of having beaten him.

The battle of Almonacid was fought on the 11th August, 1809.

"A Spanish army of 25,000 men, the most efficient that had yet taken the field, composed of the best regiments of Spain and commanded by efficient officers, was routed by some 28,000 French troops under Generals Sebastian and Dessolles the King being present at the end of the action."—Napier, Vol. II., p. 427.

4th October.—Marched to Consuegra where there is a small fort,

¹ One of the English civil agents accredited to the Spanish Government.—*F.A.W.*

in some respects a monument of the French activity in making themselves retreats from the Guerrillas. Had they been the original builders I should have condemned them for making a place of defence that is overlooked.

It surrendered by capitulation to the Spaniards after Madrid was taken; it ought now to be destroyed. These places, so common near Spanish towns, enable the enemy to command the population, whereas in the hands of the Spaniards they could never resist the attack of artillery, but their ignorance and presumption is beyond belief. To show the disposition of this province, I need only say that merely to protect them whilst transacting business, besides having this castle they have in the town barricaded streets and many strongholds.

5th October.—Still at Consuegra neither pleased nor happy.

6th October.—Marched all day in pelting rain to Lillo.

It was a distance of seven leagues and I was three hours in advance of the troop searching for quarters. I was the first Briton there just as at Domingo; the bells rang, and three hundred people stood in the rain to welcome in *Su Majestad*, who wished them *à los infernos*. Ambrose down with ague.

7th October.—Marched to Villa Tobas to cover the grand Madrid and Valencia road, it being reported that Soult's advance guard was now at Minaya, 27 leagues from Madrid, the main body of his army, counting Suchet and Joseph, being 65,000 to 70,000 men. We are shortly to be joined by troops from Cadiz under Colonel Skerrett,¹ with Ballesteros, General Maitland¹ and Roche¹ with the Spaniards at Alicante.

Lord Wellington invested Burgos on the 19th September, and the same night with the Portuguese brigade of General Pack, and the flank companies of the 42nd, 79th, and 97th regiments, took by storm the hornwork on the hill of St. Miguel. The French have made the castle very strong, and two batteries have been made against it but being commanded have not yet been opened. On the 29th a mine was sprung, which made a breach in the wall in front of the castle; it was stormed, but the supports losing their way in the darkness of the night the advanced party were driven off. Already we have lost 40 officers and 800 men.

The remains of Marmont's army under Clausel have passed the Ebro, and it is said their heavy baggage is gone to Bayonne.

October 8th.—Wrote up this book from the beginning. Ambrose goes to the rear to-morrow.

[After quitting Toledo some movements of light troops were made towards La Mancha probably with the object of observing the direction of the march of Soult's troops.

The victory of Salamanca and the siege of Burgos afforded the French Marshals proof that they could no longer maintain themselves in the

¹ Lieut.-General Maitland at Alicante commanded the allied troops on the eastern coast of Spain. Lieut.-General Roche commanded a Spanish division there. Only a brigade under Colonel Skerrett joined General Hill.—*F.A.W.*

south of Spain, Cadiz must be left, and Madrid abandoned and all the French forces must be concentrated to secure Aragon, Catalonia, and Valencia, and thus the wisdom of Lord Wellington's movement was exemplified. Those unaccustomed to reason on military undertakings and their results were not wanting in their censures for the investment of Burgos. An Engineer officer of deserved reputation¹ and celebrity has written a book in vindication of the distinguished service to which he belongs, throwing the blame of the failure of the siege on the inadequacy of the material at the command of his and the artillery corps. But I venture to believe that the object of the Commander-in-Chief was not so much the possession of the place as the drawing the enemy from the south, and setting free that large portion of the Spanish Peninsula.

So far from the Salamanca campaign being a failure as some shortsighted officers venture to call it, it was in its results an undoubted success. It is probable, had the city of Burgos fallen to our arms, that we should have blown up its defences as the French did the following year. We could hardly have hoped to maintain ourselves in advance of Ciudad Rodrigo in the winter of 1812-13, and I have always asserted that the objects of the campaign of 1812, were entirely carried out].

9th October.—In the evening we received the intelligence that the garrison of Burgos having made a successful sortie, retook their outposts and destroyed about 24 hours of our work, but were soon driven in with the loss of all they had regained. It appears they knew of a mine we had ready to spring, and so they destroyed it.

10th October.—Soult seems to have arrested his further advance, if he ever means to act an offensive part it will be now. Much rain.

11th October.—Dined with Sir William Erskine who is certainly a more gentlemanly man at his table than I had formed an idea of. Rain all day.

12th October.—The French again making movements on our front, some Spaniards seem to think they are inclined to pass the Ebro.

13th October.—I rode to Aranjuez. It is certainly a beautiful spot; the palace, gardens, parks, and shady boulevards are close to the city, which like Versailles was designed entirely for ornament and pleasure. It is the favourite resort of the King and the Spanish Court, and differs so completely from any other Spanish town I have seen, that I must fly to my beloved England to steal a comparison. The houses, of two stories only, are laid out in regular streets, but are constructed in so slight a manner as to look like temporary barracks. They are faced with a kind of plaster or stucco now fast decaying, the window frames and door posts are painted on the outside, and at a distance have a very pleasing effect, but there are so few fine houses that the town could only have contained the dependents of the royal family and its instability reminds me forcibly of an English watering place.

The King's palace is well worth seeing; it is a handsome brick

¹ Colonel Sir John Jones, R.E.

building with suites of apartments opening one into another, the floors are brick, the walls and ceilings are profusely painted and gilded in the Portuguese and Spanish fashion, the furniture so far as chairs and tables are concerned is generally bad, but the magnificent scarlet curtains, the varied damasks, and the beautiful paintings arranged according to their artists give the whole a style of very appropriate grandeur. It is to be lamented that there is no one in the palace to give a description of the paintings which would then be a greater treat to an admirer of art. The Spaniards in their magnificence are very fond of clocks, of which there are some very costly specimens here. The gardens, or more properly the pleasure grounds, contain a sumptuous display of statues, fountains, avenues, and other evidences of questionable taste; still, these are so blended with the fine timber which skirts the river each way for some miles, and some occasional good bits of architecture that the effect on the whole is very picturesque and affords the greatest delight to the eye of an Englishman, who can here trace the sylvan beauties of his native land without which no scene in nature can entirely please, though it may excite admiration. By means of a simple fall, the waters of the Tagus have been brought into the grounds, but as the stream only runs through the edges of the wood, it adds little to the beauty of the place, though millions have been expended on this improvement. The bridges over the Jarama which runs between Aranjuez and Madrid were destroyed by El Rey José when he left Madrid to prevent our pursuit.

After riding the ten leagues I got back to Villa Tobas to dinner. I had resolved to desert the cause of the south, and my intention was to procure money to enable me to undertake the journey, but in this I could not succeed.¹

14th October.—Received a letter from the North, the capture of Burgos still seems dubious.

15th October.—We lost this week one Bombardier and three gunners who died from a fever brought on by sheer weakness. I read the funeral service over some of them, and was surprised to see with what little reverence or awe the superstitious, ignorant Spaniards witnessed the ceremony, and with what little decency they behaved.

I dined again with Sir William Erskine who was even more polite than before.

[Not long before we began our retreat from Madrid in 1812, the Captain, the 2nd Captain and the senior Lieutenant of the troop were sent to the rear sick, where they were soon followed by the surgeon ill with typhus fever. Sir William Erskine the general officer of cavalry under whose orders we were went to the rear soon afterward and neither he nor my commanding officer ever returned. I was therefore though a very young officer left in command of the troop, with a younger subaltern under me.² Nearly half the men were in hospital with typhus

¹ He probably wished to join his own troop, which was with Lord Wellington's force before Burgos.—*F.A.W.*

² Lieutenant Brereton.

fever, and I had no medical attendant. My brother officer and I therefore turned surgeons; the sickness was so severe that unless we had spent most of our time in the hospital we could hardly have got the patients attended to; I well remember the devoted character of my brother officer and how insignificant everything but this duty appeared in his eyes.

There were so many cases of raging delirium that double attendance was required, where we could not supply half: the only medical assistant we had, was a Spanish medico whose school was of the true Sangrado type, but I took on myself to say who should and who should not be bled, and we shaved the patients' heads and bathed them constantly with vinegar. What more could the Doctor have done? Some poor fellows died. We were close to the enemy and this made the Spaniards a little presumptuous and they refused to let me bury the dead in their burying ground as they were heretics. I took on myself however to do this by force, but I have often since thought I was wrong, for who can say after we were gone whether these superstitious people dug up my poor comrades and gave their bodies to the wild birds of the wilderness?

Our Sangrado however was my staunch supporter; when *calenturas* were scarce he could exercise the kindred occupation of a barber, and so he was doubly useful in being able to shave heads, as well as bleed arms. This man's egotism was even ahead of that characteristic of his nationality and many a harangue did he launch at me to prove that the medical practice of the British Army and nation was altogether erroneous.

I remained in this uncomfortable predicament threatened with the advance of the enemy for some time, and it was fortunate it was so, for though I was not free from the ambition of being for one day in action my own commanding officer, yet our state of inefficiency was such that had the French pushed us, I must have left many of our men behind. As it was some had time to recover, and before we marched towards Madrid from Aranguez, I was superseded in my glory by the return of my 2nd Captain].

16th October.—Whinyates having been some days at Madrid, and Lefebure very ill in bed, I was under the necessity of putting in execution the sentence of a Court Martial on a man who merited his punishment. Though I contrived to have it in a yard and the gates shut, still a priest succeeded in getting in, and putting himself in the way begged and prayed my forgiveness for the man, this, as he was a thief, could not be granted. Then he threw down his cloak, a proceeding which I understand in this country of priestcraft, is enough to stop the execution of justice. No wonder that vice should predominate over virtue in such a country.

17th October.—Tired and disgusted with the priest of my house, who is always attempting to draw me into disputes about religion, and rain coming every day, I was not very happy.

18th October.—Marched into Aranjuez where as usual we were ill-

used by Captain Thorn, the Quarter-Master-General and our men got bad quarters, ourselves none.

19th October.—Poor Lefebure,¹ having gone to Madrid in a very bad way and Whinyates having rejoined us, I condescended to do subaltern's duty and I was all day employed in making up the accounts of the troop and settling with the men, who were in consequence all drunk. I really think a soldier with money is a worse fool than a sailor.

20th October.—A repetition of yesterday's work. Being obliged to quarter myself with poor Baldock² of Captain Maxwell's³ brigade, who has gone mad, I was allowed of course no rest all night, and nothing contented him but strutting about in my pelisse, and overturning all the apples etc. that he met with in the streets.

21st October.—The cavalry return to Villa Tobas to-day in consequence of Soult moving to our left.

22nd October.—The enemy approaching, we consequently to-day destroyed one of the bridges here, the 9-pounders first passing it. The bridges as far down as Talavera are already destroyed.

23rd October.—Preparations appear to go on for the passage of the Tagus and the destruction of the bridges as far as Toledo.

25th October.—Still in the same dull scene at Aranjuez.

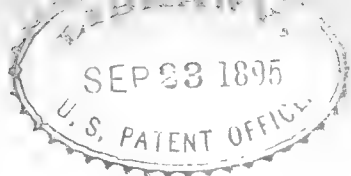
26th October.—Went to see Casa del Labrador, a bijou of its kind, replete with everything that art could supply to pamper luxury. It is to Aranjuez what le petit Trianon is to Versailles, having however greatly the advantage of the latter in natural grace. It was built by the unfortunate Ferdinand and intended to unite all the rich materials of the universe; they have succeeded completely in making it a show place, but have entirely lost sight of elegance and taste; the variety of choice marbles, the sculpture, and silk-worked hangings instead of paper, inlaid with every precious metal, and enriched with every precious stone, could not fail to remind one of the weakness of their master, and showed one a true characteristic of an ignorant Prince: I passed much of my time in the cool cellars of the palace of Aranjuez, dry vaulted excavations where the sun could not penetrate, they were empty, but their extent was such that they seemed capable of holding all the wine in Europe.

¹ Captain Lefebure died rather unexpectedly on the 22nd October. His elder brother, Charles, was transferred in 1793 to the Engineers from the R.A. He distinguished himself in the Peninsular and was killed by a cannon shot at the siege of Matagorda in 1810.

² Lieutenant Charles R. Baldock (Kane's List No. 1510), retired on half-pay 8th November, 1819.

³ 9th Company Western Division R.A. now.

(To be continued).



D I A R Y
OF
LIEUTENANT W. SWABEY, R.H.A., IN THE
PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A. ✓

(Continued from p. 423, No. 8, Vol. XXII.).

CHAPTER IV.

Retreat from Madrid. Scenes at Valdemoro. Destruction of the Retiro. Spanish cruelty. Salamanca. Retreat continued to Ciudad Rodrigo. Affair at San Muños. The Army returns to Portugal.

27th October.—The reports sent in to-day announce the further advance of the enemy. We are already driven back as far as Ocaña.

28th October.—The troop crossed the water and went to Casa del Campo, whilst I was sent to support the cavalry with my two guns and a battalion of Cacadores to a village near Ocaña.

I dined with the Major of the regiment, an English officer, and blushed at his expedient to provide wine for his table. He sent a sergeant to tell the owner of some wine that he would provide him with a safe-guard, but should expect some of the wine in return.

29th October.—The enemy's cavalry and ours were skirmishing all day. At about 8 o'clock in the evening the cavalry retired through the village where I was, when I got orders from Sir William Erskine to fall back and occupy the pass at Aranjuez, where I lay on the ground, passing cold, till 1 o'clock. Then came an order to retire across the bridge to Casa del Campo to join the troop, which I accomplished by day-light and found there General Long's brigade.

[Just before we began the retreat in 1812, the army, except the picquets, was withdrawn to the Madrid side of the river. I was on duty the night the French advanced on the other side. So strictly were we on the defensive, that it had been found necessary to cut the arches of the bridge, which had only been patched with wood after having been blown up a short time before when King Joseph quitted Madrid. When the picquets were withdrawn and I came down to the bridge, or rather to the place where the bridge had been, I found I had been forgotten, and the guns were obliged to be dragged by tackle through the river and the horses swum over].

30th October.—Our bridges being blown up we moved to Villa Campo where the troop bivouacked. We had no rations but fortunately I found a house where we got some mutton, I performed the office of cook, and at 12 o'clock at night we had some mutton chops.

31st October.—Marched again to Casa del Campo. This is one of the royal wine manufacturies. Its extensive cellars aired by ventilators from above, and containing earthen jars each large enough to hold half a pipe of wine, are very curious. In one of these cellars we took up our abode. The picquets when posted on the river were sharply engaged with each other from the opposite banks; being quiet towards evening I went down close to them at the destroyed bridge, and they were sitting at each end of the pier mutually civil and conversable. Some French cavalry crossed by the fords in small parties.

[It was at the bridge at Casa del Campo near the Casa del Labrador, a few days after leaving Aranjuez that the French picquets being amongst the trees on the one side, and our own on the other, that some of us availed ourselves of the cover offered from behind one tree to another, and crept on to the bridge. Some French officers seeing what we were about did the same thing, till at last there sat Englishmen and Frenchmen upon the opposite ruins of an exploded arch with their legs hanging over the water, and here was held a colloquy more entertaining than unfriendly. The principal subject of which was on the French side the vigorous march that they had made, and on ours, attempts to show that though they might think they were advancing their movement was in effect a retreat.¹ There was some truth in both views of the case, nor was there the least ill humour on either side, on the contrary a good deal of manly *politesse*, frequently to be met in the better class of French officers. When however the time came that the French picquet was to be relieved, the Frenchmen cautioned us that it was better to get under cover as they could not be answerable for the orders the relief might have, and we all knew that a skirmish under such circumstances is almost a certain occurrence; we therefore made profound reverences on both sides and parted].

1st November.—At day-light marched to San Pozuelos, giving up the Tagus, and passing the Jarama, the bridge over which was guarded by Colonel Skerrett's brigade just joined from Cadiz. We were under great apprehension that our commissary was cut off, he being at Arganda on the wrong side of the river. We got no rations and very little to eat.

Upon the French under Marshal Soult raising the blockade of Cadiz, some 4000 to 5000 men under Colonel Skerrett were ordered on the 9th September, by Lord Wellington to march *viâ* Seville, Monasterio, Medellin, Truxillo, etc. to join the force under Sir R. Hill. The brigade was composed of detachments of the 2nd Hussars, K. G. L., 20th Portuguese Regiment, 3rd Battalion 1st Foot Guards, detachment 2nd Battalion 95th Regiment, Company of the Royal Staff Corps,

¹ In fact the French army under Marshal Soult that had raised the blockade of Cadiz on the 24th of August, and retired *viâ* Seville, Granada, and Jean, was now advancing against Lieut.-General Sir Rowland Hill on the Tagus. See Map I.—*F.A.W.*

2nd Battalion 87th Regiment, Captains Rowan's and Dickson's companies Royal Artillery. All artillery horses and mules (excepting 170 horses) with a due proportion of artillery drivers. Wellington Despatches, Vol. IX., p. 415.

2nd November.—In the evening we turned out and went to the heights above the Jarama bridge where there had been all day a smart fire, these hills form an excellent position and we thought we were certainly intended to fight. The bridge, guarded by the 87th, but from the nature of the ground, commanded by the French artillery, was charged twice by infantry and three times by cavalry, but they could not make any impression. As soon as it was dark, however, we commenced our retreat through Valdemoro, General Cole¹ having the conduct of it. At Valdemoro, there were large vats of new wine open, and so little care was taken that 300 men were left behind drunk and taken by the enemy. We marched all night.

[During our march towards Valdemoro the enemy kept continually manœuvring to turn our left and passed over at a distance small parties of cavalry and light troops at various fords. Our retreat began over a bridge across the Jarama,² which was maintained by the 87th Regiment in spite of repeated efforts on the part of the enemy to gain possession of it. The retreat was continued at night through Valdemoro, and here a scene of the most disgraceful character ensued. It was at the time of year when the new wine was in open vats and there were many at this place. Numbers of men fell out of the ranks and surrounded them and I saw with my own eyes many actually drowned in the vats! They were baling out the liquor with their caps to their comrades till overcome, as much by the fumes of the wine as by what they drank, they sank down and expired in their glory. What a death for a reasonable being! Whether they were emulous of making their exit from this world as famous as that of the illustrious "Prince who was drowned in a butt of Malmsey" I cannot say, but undoubtedly they were as "Royal" when they died as was ever the unfortunate Clarence. However, it is certain that the army lost in this way at least 300 men. In all sober sadness this was as melancholy a scene as I ever witnessed. The men being drunk were rather deaf to the commands of their officers, and the night was very dark, but the disorder was at length put a stop to by staving in the vats].

3rd November.—We arrived at the Madrid bridge where we met Captain Cleves,³ of the German Legion Artillery, who, having the day before destroyed the greater part of the Retiro and all the battering train had returned anxious before the French came to blow up one mine which had failed. I volunteered going with him. When we went

¹ Lieut-General the Honorable Lowry Cole, Commanding 4th Division.

² The Puente Larga below the confluence of the Jarama and Henares. There was also a bridge of boats over the former river close by a little above Bayona. Napier, Vol V., p. 311.

³ 2nd Captain Andrew Cleves commanded a 9-pounder brigade at the battle of Albuera, where he was taken prisoner, but escaped on the field of battle. He also commanded a brigade of 9-pounders at the battle of Waterloo.—*F.A.W.*

into the mine I could not but notice a want of caution in the way the train was laid, but nevertheless agreed to do the job with him. He, anxious to perform his duty without assistance, sent me to see if the coast was clear, and put the match to the train, when to my dismay the whole exploded before he was out of the building, and so persuaded was I that he had perished, that I dismounted from my horse and took a shovel to dig him out, when, making my way in the dark through the smoke that almost suffocated me, to my astonishment, he came out, with no other injury than being well burnt. The day before two Clerks of Stores and some men were blown up.

As to Madrid, I can scarcely say I entered it, having only gone into one street to purchase a pack-saddle. As the Escorial road passes it, it winds majestically above a beautiful stream. Its palaces and buildings strike the eye as beautiful. How painful it was to me only to have a distant view! We this day joined here the divisions¹ of Lord Wellington's army that had been quartered there. The people of Madrid were constant to the last, and even cheered them, though left to their fate. We did not get into camp until 10 o'clock at night, and at 12 broke our fast for the first time.

[During the retreat in November 1812, we passed by the road to the Escorial close to Madrid but can hardly be said to have seen it. The inhabitants however were true to the last and cheered us as we left them to their fate. The building called the Retiro was a square stone massive edifice having every capability for a fortress sufficient to overawe the inhabitants. It was decided to breach it in several places by blowing up the angles, and in this there was no great apparent difficulty, because it was built over immense vaults. However, the day before I arrived there with the rear guard, it had only been ineffectually done, and some men had been killed in the explosion. An officer of our German Legion Artillery was engaged in completing the business and General Long, whose cavalry were the last in the line of march ordered me not to assist him, but I suggested it would be safer to take an escort of dragoons to prevent the inhabitants interrupting the operation. To one of these I gave my horse and went into the vaults with the German. I could not help remarking a degree of recklessness in the preparations; however, there was no time to lose and I went out to ascertain that there were no persons within reach of danger. Whether by accident, or because my companion was jealous of my presence, I cannot say and never ascertained, but I had hardly got into the open, and by no means indeed out of danger, when up flew the corner of the building into the air and the breach was indeed effectually made! My first act was to rush into the vaults of the building which I did without a light. It seemed in vain to hope that the perpetrator of this rash act, rash if designed, could have escaped, and my only idea was to recover his body, but to my utter terror and dismay I ran against him in the dark vault: a feeling of horror came over me, and my first impression that I had encountered his spirit gave

¹ Three weak infantry divisions and two weak cavalry brigades. Wellington Despatches, Vol. IX., p. 437.

way to greater anxiety as I led this walking cinder to the light. Here, as soon as I could see him, was a spectacle! every hair on his head was singed, and he was perfectly black and blind, yet though he was scorched by the explosion he was not burnt, and I understood afterwards that in spite of much suffering he recovered. This gallant fellow's idea was that he would rather perish than not succeed in the duty that had been assigned him, and which had not been effectually done in the first instance. I have no doubt that the great strength and weight of the building, together with the immense subterranean vaults which offered insufficient resistance at any one point, rendered the operation less simple and easy than might have appeared to a mere spectator.

While detained in the business of rendering the Retiro a place suitable for anything rather than seclusion, of course the troops, saving the very last videttes, had passed on. After having provided for the safety of the poor German officer, whose appearance as I left him might have made a personification of the head of any member of the satanic empire, I was anxious to get to my corps. Nothing in particular met my observation, the dragoon escort had gone on some time, but as I advanced on the road I became alarmed all at once by some firing in front of me. On getting near the spot one of the most heart-rending and dastardly spectacles which can be imagined met my eye; some unfortunate French prisoners who had been left in Madrid were huddled together by the side of the road and their Spanish escort was leading them up one by one to shoot them at a certain tree, which they had chosen for a place of execution. There could have been no reason why these emaciated wretches should have been brought from their hospital in Madrid, had they been left there they would have fallen again into the hands of their own people. Unable to walk they could proceed no farther, and their inhuman masters were in many instances at their own request, taking this summary way of terminating their misery. For ought I could tell some of the finest spirits that ever served in the ranks of the French army might have perished in this ignoble manner. What a death to die! certainly the feeling of exasperation ran high amongst the Spaniards at this time, but to give it this vent displayed ignorance and barbarity more suited to savages than a Christian people claiming to rank in the order of civilization. I rode up to put a stop to this enormity, but being alone, vain were my remonstrances, and force was out of the question. I did indeed draw my sword but the musquets were immediately levelled at me and I found any resistance useless. This good however happened, a little time was gained, and a party of the 95th came up under a sergeant whose orders were to keep up stragglers. These men interfered, and the French being near at hand the rascals were under the necessity of abandoning the survivors].

4th November.—Marched to the Escorial taking with us five men of Macdonald's troop. Part of the wounded left at Madrid, some of them with five, six and seven wounds. On the march we passed Majalahonda where their catastrophe took place. I had not time to visit the ground where the heroes lay. It appears three guns were taken, and those men

who were retaken were barbarously wounded. We did not get till after dark to the Escorial, so that I could not examine it, nor did we get anything to eat until 10 o'clock at night.

[There was but little time allowed to examine the wonders of the Escorial, it is on the western face of the Guadarrama mountain, the hasty view of things which I was constrained to take was very mortifying, but our orders for marching were rather sudden. Our commissariat supplies were regularly brought to us by alternate services of two brigades of muleteers, one of these was Spanish and the other Portuguese. The Spaniards were Andalusians, the finest specimens of that superb people. The Portuguese had some very handsome fellows among them, particularly the *capitraz* or leader.

At the Escorial we happened to have the Spaniards and they were rather dilatory in starting; though it was not my proper business, yet I was helping the commissary in getting them into motion, and in the haste I struck the leader with a small stick by way of quickening his movements. The man vowed eternal vengeance and I was several times cautioned by some of the others that he meant to have my life, but the affair passed over without any consequences. These Spanish muleteers who, from their erratic habits and gipsy lives, are not at any time remarkably amenable to the laws of civilized life, were still less likely to be so then.

As we approached Lord Wellington I anticipated speedy reunion with my own proper comrades. On the march from Madrid we overtook five of them who had been wounded, made prisoners by the French, and left there after the affair at Majalahonda; one of these never after quitted me till he and I left the service. The troop on that occasion had been pushed forward with a brigade of Portuguese cavalry who ran away and left it to its fate in the hour of need. My man had five sabre stabs, yet he lived to serve me with great fidelity and regard, and after the war perpetrated matrimony and set up a respectable shop, I never heard in what line, in his native town of Bolton in Lancashire. He was a good fellow, very fair, fresh and good looking. His name was Marsland, which I should not have chronicled had it not occurred to me that the Portuguese girls who had a great affection for him always called him "*mas lindo*" which being interpreted means "more handsome." This poor fellow would have infallibly lost his life had I not put him on one of my horses, for he was but a spectre at the time I overtook him. Circumstances of this kind level all conventional distinctions of rank, and I believe few stronger attachments exist than between this poor fellow and myself].

5th November.—Marched at day-light. The palace of the Escorial is not worth seeing, except for the royal sepulchre. It is composed entirely of marble, as are the coffins, one of which is now ready for Ferdinand with his name inscribed. The body of Charles V. is said to be here, though some say at Toledo. The richness and beauty of the pasturage at the Escorial at once stamps it as the birthplace of the Merino flocks now gone with their miserable masters. To-day in

passing the Guadarrama mountain, which is of immense height and easily defended, I began to realize the miseries of the retreat; animals knocked up, men and women failing, and every kind of woe; but all I saw made but a slight impression compared to the horrid massacre of some unfortunate French prisoners by a Spanish escort, who with the utmost composure shot them like dogs. We were not near enough to arrest their cursed purpose, but when we remonstrated were told that they frequently served them the same, and moreover, that they had requested to be shot. Inhuman wretches! They had reduced them to despair by starvation, and then thought their deeds justified by the desperate request! O cowardly, villainous Spain! too proud to take the necessary measures for your own defence, too cruel to turn a deaf ear to the dictates of dastardly revenge!

We got to Villa-Castin after dark and slept in an empty house after a hasty beef-steak.

Napier's opinion of the conduct of the Spaniards towards the enemy, of which we have had several notable instances, is given in Vol. II., p. 407 thus: "The principal motive of action with the Spaniards was always personal rancour; hence, those troops who had behaved so ill in action, and the inhabitants, who withheld alike their sympathy and their aid from the English soldiers to whose bravery they owed the existence of their town, were busily engaged after the battle [Talavera], in beating out the brains of the wounded French as they lay upon the field, and they were only checked by the English soldiers, who in some instances, fired upon the perpetrators of this horrible iniquity."

6th November.—Marched to Martinmuñoz, where, with General Long's brigade, we expected to be quiet for a few days, not knowing which road the enemy might take, Salamanca or Segovia.

7th November.—Set off in a hurry; the brigade lost some baggage and we had two men taken prisoners who were employed by the commissary. The troop marched on and I joined the Hussars with my guns and slept all night on the ground in my cloak.

8th November.—In the morning joined the troop; marched all day in the rain, and after dark encamped at night on the Salamanca road also in the rain. As we could not make the fire burn and had no wine, we had little food to eat.

9th November.—Marched at day-light and encamped with the whole army just at dark at Penaranda. For the last three days the unfortunate sick, unable to proceed, have been daily falling into the hands of the enemy.

10th November.—This morning I rode forward into Penaranda to buy some cloth, being entirely without clothes; whilst in the shop there a cry was raised that the French were coming and the Spanish cavalry galloped in disorder through the town. Sutton and I mounted our horses and rode our best till clear of the town. I then pulled up and with another officer tried to rally the Spaniards. We soon halted

all the English, and discovered that the cause of the false alarm had been some of the heavy dragoons galloping in by General Hill's order, to stop plunder, which had commenced. I then went back and completed my purchases, happy in having seen at so little expense the effect of the French entry into a Spanish town. Whoever was in the street, man, woman, or child, took to their heels, many mounted their neighbours' mules which had thrown their riders, and much baggage was plundered and cut away so that the people in charge might escape.

We crossed the Tormes at Alba¹ in the rain, and the troop halting on the other side, I bid it adieu, and pushed on to join Macdonald at Salamanca;² encamping with Ross who was on the side of the road.

11th November.—Saw the two Arapiles and the position contended for on the 22nd July, by which I was sufficiently convinced that darkness alone saved Marmont's army from total ruin. Arriving at Salamanca I found Macdonald there, and rode with him to Villa Mayor where the troop was, and joined my old friends with infinite satisfaction, being very glad of the rest.

12th November.—Rode to Salamanca to purchase clothes from the want of which I had suffered much. Salamanca is a good town and contains more shops than any other I have visited in Spain. What remains of its desolated convents is grand; the cathedral, externally very little inferior to Toledo, still stands.

13th November.—Turned out early this morning in consequence of a skirmish between the out-posts, and returned late to Villa Mayor.

14th November.—One day of welcome rest.

15th November.—We marched out in force to-day and took up the position of the Arapiles. The enemy was engaged twice to-day on the river with the second division and was repulsed. It rained all day and all night in our camp.

16th November.—Finding the enemy declined fighting and turned our flanks, we were obliged to recommence in the rain a precipitate retreat on the Rodrigo road, which was so deep that many a poor wretch actually perished in the mire. Nothing could exceed the distress of the infantry; worn out men and women resigned to their fate waiting the enemy on the road, some even already dead; of these stragglers the greater number were Portuguese. It was evident that in adverse fortune these fellows had not half the fortitude of the English, and even sobbed aloud in an unmanly manner. We bivouacked after dark in the wet and rain.

17th November.—We retired at day-light, the light division forming the rear-guard and ours their support. In passing a wood, actually within shot of our division, 50 or 60 French cavalry posted there plundered the baggage of our Commanding Officer, Lord Dalhousie. We chased them with our detachments, but they made off having

¹ The troops under Lord Wellington from Burgos, were now united with those under Sir Rowland Hill from Madrid.

² On this date Lieutenant Swabey quits "D" troop and his diary in future deals with his own "E."

taken prisoner Sir Edward Paget,¹ who was riding out of sight in front of us, and who, I suppose, would as soon have expected to see the devil.

Directly afterwards we crossed a rivulet,² and took up a position to check the enemy. At the place where our rear-guard forded there was a height that entirely commanded us. On it the enemy brought up their guns with astonishing rapidity, and from thence fired with great execution on the light division as it boldly dashed through the water. When all had crossed they turned their fire upon Whinyates' and our guns³ which were immediately under their muzzles, and unable on account of their height above us to return the compliment. Almost the first shot wounded poor Macdonald and three men at my gun; Macdonald being so close to me that we touched, I supported him till he was carried off. We remained four hours calmly receiving the enemy's fire, and occasionally checking their infantry and keeping the passage of the river; Lord Wellington gave no orders but to reserve our fire for formed bodies, none of which appeared. Many were the hair-breadth escapes of men and horses; the wet state of the ground, which kept the shot from rising, and the mercy of Providence, alone saved us from certain destruction. At 11 o'clock we got to a wet camp in the rain and broiled some beef.

18th November.—We continued our retreat, the road up to our axles, objects of misery accumulating at every step, wounded forced to walk, dead and dying strewing the road. What hurt me more than anything else was that from the urgency of the service we were obliged to refuse to carry them on our carriages. We encamped again in the wet with nothing to change or to eat.

19th November.—We arrived to-day unfollowed by the enemy at Rodrigo, and crossed the Aqueda. There I saw poor Macdonald who is seriously wounded by a splinter, of immense size, which passed through the upper part of his thigh; it is not thought dangerous but will be a terrible trial of constitution. Encamped in the rain.

20th November.—Marched at last to quarters in Alamedilha; the town so crowded that we could scarcely find room. It appears this year that we shall have the start of the people in regard to forage, as here it is all unconcealed.

21st November.—Having a little leisure to think and to write, I record my impressions of late events. The fundamental cause of our giving up Madrid, I attribute first of all to the total abandonment by

¹ The commander of the French cavalry on this occasion was a Major Mourelle, as will be shewn from the following extract. "Amongst a number of agreeable persons whom I met that evening was a Major Mourelle, who had long served under Napoleon in Italy and Spain, but unfortunately for his own interests, had adhered a little too long to Napoleon's cause. It was Major Mourelle who took Sir Edward Paget prisoner at Huebra near Ciudad Rodrigo, on the 17th of November, 1812. He wore a seal which was given him by Sir Edward Paget. After the peace Mourelle was reduced to the rank of Captain. When I met him [December 1830] he was in command of the troops at Bintenzorg [Java]." "Fifty years in Ceylon," by Major T. Skinner, C.M.G., p. 137.

² The Huebra, a branch of the Yeltes river, the place of crossing was at the village of San Muños.

³ On this occasion 5 of the guns of "D" troop were injured by the fire of the enemy.—*F.A.W.*

everyone of the slightest hope that the Spaniards will ever do anything to help themselves. The trial was fairly made during our possession of Madrid. The imbecility of their government, but more than all their national arrogance, blinded them to the necessity of active and efficient measures, and rendered the opportunity useless. The moment of action whilst the country was in possession of their government was lost. They were then too short-sighted to fancy anything farther necessary, they failed in their engagements to Lord Wellington, and lost their independence for ever. I should be far from taxing them with a want of patriotism; they gave the most unequivocal proofs of their loyalty and even of their friendship for the English, by following them with *vivas* to the very gates of Madrid.

In stating an opinion of the regular Spanish troops already in the field, it may be said that the same causes render them collectively useless. They will not face the enemy, and, excepting at Saragossa and Gerona,¹ they never have done so. They are deficient in officers, and the leading feature in those they have is presumption. So great is this national fault that it extends to all ranks; it prevents the general from taking up a good military position, and induces the soldier to despise with his tongue an enemy, at the first rumour of whose approach he is ready to run away. For want of co-operation with the civil authorities, a large army of Spaniards cannot be supplied without plundering or distressing the inhabitants; this is carried on without regard to humanity, and starvation is not the only evil accruing from it.²

To return to the immediate causes that obliged our retreat. At the head of them I must place the failure before Burgos, and, in justice to my profession I must censure, though unwillingly, the conduct of Lord Wellington. Though frequently warned that the means were totally inadequate to success, and while confessing that the fate of the place was not of importance, he would not, after once sitting down before it, raise the siege till Soult was encouraged to advance, and Masséna³ had arrived with a superior force in his front. Some think General Hill

¹ The sieges in which the Spaniards distinguished themselves were:—

Saragossa besieged twice in 1808. The first siege was raised in August in consequence of the surrender in July of General Dupont at Baylen to General Custaños. The place was again invested December 20th by the troops under Marshals Monecy and Mortier; on January 22nd Marshal Lannes assumed the command. The Spanish defence was prolonged, and most heroic by the civil population as well as by the garrison. But they were forced to capitulate February 21st, 1809. See Napier, Vol. II., p. 25, *et seq.*

In the lately published memoirs of General Marbot, aide-de-camp to Marshal Lannes, are some interesting details of the operations.

The French twice besieged the city of Gerona in 1808. On June 4th, 1809, it was invested for the third time by General Verdier. Marshal Augereau assumed the chief command on October 12th. But the defence under the brave Governor, Mariano Alvarez, was so determined and gallant that the city held out till December 10th, when after a period of six months of opened trenches it surrendered: a defence which eclipsed the glory of Saragossa. See Napier, Vol. III., p. 22, *et seq.*

² The Spaniards, now in the fifth year of the war, were still in the state described by Sir John Moore, "*without an army, without a government, without a general.*" Napier, Vol. V., p. 253.

³ Masséna after the battle of Fuentes de Honor, in May, 1811, resigned his command and returned to France. He was succeeded by Marshal Marmont; upon his being wounded and the French army defeated at Salamanca, in July 1812, Masséna who had been given a command in Provence, was again nominally put in command of the army of Portugal and of the north of Spain (see Wellington Despatches, Vol. IX., p. 44), he did not however take the field, though likely enough reported in the allied army to have done so. At Burgos the French army was commanded by General Souham.

might have fought to cover Madrid, but he would then have felt himself in an awkward situation, because Soult might have delayed as long as he pleased, while Masséna might either have united with Soult against him, or what was as bad might have marched on the Segovia road and thus have placed himself between Lord Hill and Lord Wellington. The force of the latter would not have been sufficient to have prevented the enemy from choosing his own plan of operations as their communications were open. The only way then that could succeed was for us to fight united at Salamanca; this, Soult knew, would not drive us to Portugal so easily as moving on our flanks, he therefore declined, and we could not keep our position when turned.

Another cause that helped to move us was our want of provisions, for it is well known that many regiments were for two or three days on the retreat without rations, and the very officers of the 16th Dragoons had nothing to eat but acorns. As to our horses, for four days and nights they actually had not so much to eat as a blade of grass, the poor devils eat the very harness off each other, and I mention it as a remarkable fact, that to one horse we gave a feed of sand stone which he munched up with infinite satisfaction.

That Lord Wellington quite endorsed the above opinions regarding the Spanish troops is evident from what he wrote to Lord Bathurst.

"They [the Spaniards] cry '*viva*,' and are very fond of us and hate the French: they are in general, the most incapable of useful exertion of all the nations that I have known, the most vain, and at the same time the most ignorant, particularly of military affairs, and, 'above all, of military affairs in their own country.'"¹ And, replying to Mr. Croker, "Did you ever see the Spanish troops stand to their work?" He replied, "No! the best would fire a volley while the enemy were out of reach, and then all ran away. They were no doubt individually as brave as other men. I am sure they were vain enough of their bravery; but I never could get them to stand."

22nd November.—No news from the front to-day. The enemy does not come on but appears satisfied with what he has gained. The out-posts send in our stragglers, I understand to the amount of 1000 men. Our loss altogether no one ventures to compute, but I should think not less than 4000, 600 were killed and wounded the day we were engaged.

23rd November.—For the first time got a comfortable dinner and some of my clothes dried: it is remarkable that very few of our men have suffered from sickness.

24th November.—Our little doctor joined us to-day from attendance on Macdonald.¹ He takes the same view of the case that I have

¹ Assistant-Surgeon A. Macdonald, M.D. (Kane's List 137). Served with the troop to the end of the war. He accompanied it to Belgium in 1815, and was present at the battle of Waterloo. In 1834, when he was employed on the Medical Staff at Halifax, Nova Scotia, he bought land in Prince Edward Island, which he visited in after years, and then met his old comrade and friend much to their mutual satisfaction.

before given, but to me the opinion about the trial to his constitution is by no means satisfactory.

25th November.—Upon calculating our losses on the retreat, we find we have only destroyed four horses and two mules, and brought in all our carriages; one brigade of artillery lost 48 horses and blew up various carriages. I believe in proportion to our numbers, no regiment, troop, or company has come off so well in the *whole* army.

26th November.—Went out coursing; killed a hare which we sent to poor Macdonald.

27th November.—Marched by route through Villa Mayor to Minsella, crossing the Coa at Ponte de Aigues. Never was such a place for artillery. St. Estevão,¹ Val de Lobo, and Villa Velha are jokes to this; we were obliged to take the guns down by hand. It is owing to the difficulty of the country from Almeida to the mountains of Plasencia that the Coa is esteemed a defence. We did not arrive till late at night. The circumstance of a triumphal arch being built on this bridge, leaves no doubt in my mind of its being a Roman work, which idea is strengthened by the antiquity of Villa Mayor though I cannot exactly trace the Roman building in it, but this is very seldom to be found here in consequence of so many different superstructures being erected on the ruins.

28th November.—Marched to Sardiera where, bad as they were, we had our quarters to ourselves.

29th November.—Marched over the Guarda mountain, part of the Estrella, to Ponte de Carne. The road is very difficult for artillery, and it is to be noted that facing towards Celorico there is a road round the right of the Guarda mountain, which though difficult is far preferable to the ascent at Guarda. In crossing it the perch of an ammunition waggon broke, and I remained till we contrived to make it fit to travel. This job took us till dark and under these circumstances I descended the stone road from Guarda. The hill is at least a league in length and so rough that nothing but the fact of its being dark and our not seeing it could have given us nerve for the attempt; one shaft horse fell three times. By dint of perseverance I arrived after dark at Ponte de Carne, where I overtook the troop.

30th November.—Began to reascend to Celorico by terrible hills, the final one up to the town being next to impassable for artillery. One of my waggons was overturned into a deep hole, and I can scarcely account for our getting it out; but we accomplished it with such promptitude that it surprised every one. We passed through Celorico, a place of which I had heard a great deal, but like all Portuguese towns it is filthy and has little trade or other recommendation. Quartermasters may get tolerably supplied here on Tuesdays, and it is a safe situation for a dépôt. We halted at Villa Cortes, where we did not arrive till late. Captain Brandreth's brigade² of artillery, which we passed on the road, was obliged to leave all its spare carriages at

¹ Passes in the Sierra de Estrella.

² No. 10 Company, 5th Battalion, R.A., reduced 1819.

Celorico. Rather a feather in the caps of those who have brought in their number.

1st December.—Remained in our quarters on account of General Clinton's division having made a general halt for their clothing.

Ramsay with Bull's troop came in the evening with a route to this place. As the town could not hold us both, he, presuming on being senior officer, ordered us out, Dyneley very properly refused to move, which unfortunately set the two Commandants at loggerheads, this however did not make us change our quarters.

To be continued.

EASTERN AND WESTERN VIEWS OF MOUNTAIN ARTILLERY.

A REVIEW.¹

BY

MAJOR. H. C. C. D. SIMPSON, R.A.

THE organization of the various European Mountain Artilleries has been freely discussed in the pages of these Proceedings. The service of Mountain Artillery is not exclusively confined to these Powers, and in the two great Nations of the East and West, Japan and the United States of America, public attention has been recently drawn in the military journals of these countries, to the useful and more general employment of this efficient and economical branch of the Artillery Arm.

The Mountain Artillery of Japan, prior to the commencement of the present war, would appear to have consisted of 1 Mountain Battery of the Guard, and 6 Line Artillery Divisions each of 2 Mountain Batteries.

Japan.

The establishment of a battery consists of 1 1st Captain, 1 2nd Captain, 3 Lieutenants and Sub-Lieutenants, 1 Sergeant-Major, 6 Sergeants, 1 Quarter-Master-Sergeant, 1 Armourer-Sergeant, 1 Sergeant-Artificer, 12 Corporals, 6 Artificers, 148 Gunners and Drivers, 86 Riding and Pack-Horses, and 6 Guns.

The guns are French *pièces de 4 de Montagne* of the Lahitte system, and a few batteries of Mondwell Mountain Guns.

The officers and drivers carry cavalry swords, the gunners Spencer carbines and sword-bayonets. The dominant colour of the European pattern uniform is blue, with brown leather long boots, and the German cap.

The pack-animals are cobby ponies, height from 13 to 14 hands. The girths are put on with one girth in front and another in rear of the animal's belly. Guns can also be put in draught.

The men of the Field Batteries are instructed in Mountain Artillery duties, so as to be available when required for this service.

In the Insurrection in Kin-Sin in 1877 they were so employed on a large scale. It seems to me a pity that some training is not given to some of our Garrison Companies in the colonies on the same lines, in order to fit them for service with our small expeditionary columns, for which our regular Mountain Artillery is an insufficient source of supply, and which are of constant recurrence throughout our colonial

¹ "Official reports on Mountain Artillery of Japan. The Pack-Mule and Mountain Artillery," by Captain Schenck, Second Artillery, U.S.A.

possessions. The expense would be very small at stations where there are government pack transport animals.

During the present war the Mountain Artillery has rendered most distinguished services, notably at the taking of Port Arthur, where from the rough and hilly nature of the ground, it was only possible to bring the mountain guns into action at the commencement of the assault, the heavier guns being unable to get into position. Tokio, Thrishimo, Nagoya, Basaka, Sendai, and Kumamoto are important Mountain Artillery depôts.

United
States.

In America up to within the last twenty-five years the 12-pounder mountain howitzer was largely employed in the Indian Frontier Expedition. The 1.65" B.L. Hotchkiss—so-called—mountain gun of 110 lbs., firing a projectile of but little more than 2 lbs. weight, and without a time fuze was introduced some years ago in its stead. The Indian had a wholesome dread of the former, but none of the latter gun, so Mountain Artillery has rarely been employed by American commanders in recent years.

A very able paper (*see foot-note p. 439*) was published in the October number of the *U.S. Artillery Journal*, advocating the employment of an efficient mountain gun by the government for employment on their Indian and Mexican frontiers. The nature of the proposed equipments and its organization are laid down after very careful consideration of detail, and the paper is well worth reading by officers interested in Mountain Artillery matters in our own army. The author commences his paper by laying down as an axiom, that the question of mobility as applied to Mountain Artillery appears to be of as great importance as in any branch of the Field Artillery, and that in a consideration of the subject, two distinctions are met with, viz.:—On the one hand an organization suitable for rapid movements with cavalry over the most difficult country in which military operations is practicable for this arm, the gunners being mounted as in Horse Artillery, but dismounted when the guns are to work with infantry. And on the other hand, an organization and material wherein mobility is in a measure sacrificed, in order to secure increased power of fire for the guns, a maximum supply of ammunition with as few animals as possible, and the gunners always on foot, and therefore the battery incapable of serving with cavalry on long and rapid marches, it being held that cavalry can find no legitimate use in a field of operations necessitating resort to Mountain Artillery. In these extreme views, few European Mountain Artillery officers of experience would agree. Small bodies of Cavalry or Mounted Infantry as scouts, orderlies, etc., find even in mountainous country a suitable rôle; and where cavalry could act in large bodies and Horse Artillery could not keep up with them, must be a rare occasion indeed, and not at any rate in our service worth providing against.

However, for the two conditions of service he lays down, the author says the result is two very distinct classes of guns with packs for the animals corresponding therewith, these latter for the more mobile batteries ranging from about 260 lbs. to 290 lbs. per pack, and in the other from about 290 lbs. to 350 lbs. This apparently small difference

in the weights of the packs is in fact a wide one, and very materially affects both the mobility of the battery, the power of the fire, and the ammunition supply—if not in number of rounds, at least in weight of projectile, for the number of rounds per gun can seldom vary much from 100.

Now with on the one hand the gunners mounted with a light gun, and on the other hand gunners dismounted and a heavier gun, each country on service must in its selection be governed by the conditions which are likely to predominate in war.

Now in the United States in the most important operations on her N.W. Frontier, against the Indian tribes, the most formidable portion of whom are mounted, the Cavalry or Mounted Rifles has always been the most important arm. In the British service, whether in the mountains of our Indian frontiers, the jungles of Burmah, the desert of the Soudan, or the bush of Ashanti, the Infantry has always been the most important arm, and attention has been directed towards providing two different pieces, organized however on much the same lines, for the following conditions of service:—

- (a) Long range fire with as powerful a piece as is compatible with a certain fixed limit of pack-animals for its transport.
- (b) Curved fire with a heavy projectile at shorter ranges, under circumstances when the minimum number of animals may be slightly exceeded.

The 2·5" screw gun and the 4" jointed howitzer are the most modern representative pieces of these two desiderata. Batteries are only equipped with the former, the double shell of the small 7-pounder 200 lbs. gun inefficiently fulfilling the requirements of (b) at present in the equipment of a few batteries.

Personally I believe in a general service gun for our Mountain Artillery; that is, one with a slightly lower velocity than the 2·5" gun, but with a lighter projectile than that of the 4" howitzer. In other words, a gun in two portions that will throw the same projectile as our Horse Artillery gun with a muzzle velocity of 1300 f.s., and a limit of effective range 3500 yards.

Captain Schenck believes that with the improvement in the construction of guns and their greatly increased ballistic powers, it would appear reasonable to be able to secure a sufficiently powerful mountain gun and an adequate ammunition supply with such pack-loads as to permit of service with the cavalry when necessary, by providing mounts for the gunners, and at the same time to possess a gun whose power of fire will prove ample for any demands when serving with the Infantry. Indeed for reasons economical as well as of expediency, the United States he says must adhere to a single gun and equipment for all Mountain Artillery.

That this may be possible, necessitates a proper relationship between the pack-loads of the battery and the loads carried by the cavalry horse, and ordinary cavalry pack-train, the degree of mobility, *i.e.* weight of pack-loads being suited to the movements of the Cavalry rather than to the foot-pace of the Infantry. At the same time

the greatest possible power of fire of the gun together with the ammunition supply for war purposes, without entailing an unwieldy organization in *matériel* and *personnel* for the battery must be secured.

Before passing to the consideration of the *matériel* for a Mountain Battery, he enters into a long dissertation on the pack-mules of the United States and those of their neighbour, Mexico.

Although interesting there is nothing very novel in his remarks. He certainly proves the excellence of the Mexican mule as a weight carrier, which we might take a note of in India for future reference, when seeking for remount mules for our batteries there. He reckons that a good mule will carry of solid freight a load equal to 30 per cent. of his own service weight (from 800 to 1000 lbs.), that is from 280 lbs. to 360 lbs. including pack-saddle, excepting in long and rapid marches when animals of this weight should not be loaded in excess of 240 lbs. The pace of the mule should be about 4 miles. If required to trot, the trot should be the "slow trot," *i.e.* 6 miles an hour. Captain Schenck now puts this equation before us:—

Let d = the distance a mule can travel daily if unloaded.

" w = the weight under which he could not travel at all.

" w' = some weight less than w , under which he could travel d' miles per day.

Then there obtains—

$$w' d'^2 = w (d - d')^2.$$

Now the work or useful "effect" will be a maximum when $w' d'$ is a maximum, or when $w' = \frac{4}{9} w$ and $d' = \frac{1}{3} d$. Or in other words, the mule will accomplish the most work when he transports $\frac{4}{9}$ of the load under which he would stagger; and he will travel just $\frac{1}{3}$ of the distance he could if he carried no load at all.

If a mule is able to travel 20 miles per diem carrying a load of 256 lbs., and 50 miles per diem when he carries nothing, his best load will be 316 lbs. carried about 17 miles per day.

I have personally after experience in our own Mountain Artillery, and from witnessing that of continental nations working under service conditions, arrived at the following conclusions, as to this knotty question of the weight-carrying powers of ordnance mules in different climates and conditions:—

Top-loaded
mule

- (a) A carefully selected mule can carry, throughout the vicissitudes of active service, a total load (including its harness) of 304 lbs. of which $\frac{7}{10}$ weight may be a top-load. But I consider that the mule must be "relieved" on long marches whether in hills or plains in a tropical climate. In a temperate climate the mule need not be "relieved" in marches in the hills, but there are circumstances in which it may be desirable to do so in the plains. This is in accord with the French and Italian views, and is for this reason. In marching along the hill paths, the centre of pressure of the road is constantly shifting, the air is purer and cooler, and from the absence of macadamized roads, the mules do not

become so foot-weary, and so are naturally less fatigued. This is one of the strong reasons in favour of draught in Mountain Artillery. In tropical climates this relief must be carried out by additional pack-mules; but in a temperate climate the relief in the plains can be carried out as hinted above by some simple arrangement of draught, varying according to the nature of the equipment, a *sine qua non* being, that there must be no increase of consequence in the pack-loads and none of mules.

- (b) For compact side-loads, such as boxes of ammunition, an ordnance mule can carry a pack (including its harness) 20 per cent. greater than that of a top-loaded mule and requires no regular "relief."

Side-loaded
mules.

The above weights are a maximum, and require mules of the best type of the breed, and their height varies with the breed. In hot climates the mules do not run so high as in a temperate climate, other conditions remain the same.

But, says Captain Schneck, if we are to march with Cavalry without becoming an encumbrance upon its movements, it becomes necessary to study the loads common to that arm of the service, both for its troop horses and the mules of its pack-trains, and govern our pack-load for a Mountain Battery accordingly. He then enters into details on the weight carried by a cavalry troop-horse, and arrives at the result that the heaviest nominal load for the latter is 272 lbs. in the United States, of which $\frac{2}{5}$ of it is "live" weight. Now the pack-mules of the United States cavalry-train carry 225 lbs. including pack-saddlery, and with care can keep up on the march with the Cavalry. But the Artillery pack-mule will be a more powerful and more carefully selected animal than the ordinary pack-mule, better fed and receive more care and attention, and is more likely to be relieved when sick or over-worked. But when all the conditions of such service have been carefully considered, it would appear safe for us to conclude that no pack-load in a Mountain Battery for American service should exceed the maximum load carried by their cavalry horse—272 lbs.—when for service with Cavalry. Naturally if it can work with Cavalry, it will be able to manœuvre over any ground with Infantry.

Having decided on his pack, it is obvious that the pack-saddle should be reduced to a minimum weight consistent with efficiency.

In the Mountain Artillery it always must constitute a large percentage of the weight which an animal can carry on account of the necessity of adding special features to the cradles in order to secure the gun, carriage, etc. The Moore pack-saddle used in the United States transport weighs complete 40 lbs. Generally speaking, however, a set of artillery pack-harness varies from 45 to 71 lbs. in weight. The pack-saddle, harness, and lashing of the old United States 12-pounder mountain howitzer weighed 50 lbs. and served its purpose well. In the British service a set of pack-harness for the 2·5" R.M.L. gun varies in weight from 72 to 87 lbs. according to the nature of the load transported. The United States artillery pack-saddle weighs from 58 to 65 lbs., but

Captain Schenck is confident this can be reduced all round to 55 lbs. at the most, by converting the saddle to the Moore principle. The ammunition saddlery can be brought down even to 50 lbs. in his opinion. He does not describe the Moore saddle. He then arrives at the remaining factor of greatest importance in a Mountain Battery, viz. the power of fire of the gun, modified by the condition that the gun, together with the carriage and implements etc., must in his opinion, admit of being carried on not more than 3 mules, and that each gun shall have with it in the field about 100 rounds of ammunition, without the latter necessitating an unduly large number of mules for its transportation. This is generally limited to 6 or 8 packs per gun, with a reasonable supply of pack-animals spare—3 per gun—increased in the batteries to act with Cavalry, by the animals of mounted men killed in action. This latter statement seems a very unreliable one in my opinion, as presumably the percentage of mules killed, or put out of action temporarily will be almost as high as the men.

The writer then details all the old arguments for and against quick-firing guns as compared with the ordinary loading piece, arriving at the same conclusion as ourselves, that the carefully observed fire of a heavy shrapnel from the latter is preferable to the rapid loading light projectile of the former. The weight of projectile for the most powerful class of mountain guns in Europe varies from about 8 to 13 lbs. nearly. With 13 lbs., allowing $\frac{1}{2}$ lb. as a maximum possible service charge of smokeless powder, and 20 lbs. as the weight of the ammunition box—the same as for the old 12-pounder howitzer, with 7 rounds in a box; the weight of the ammunition box packed would be about 115 lbs., or the total weight for ammunition pack-load of 14 rounds would be 280 lbs., the same as for the old gun. Captain Schenck does not however tell us how he disposes of the following very necessary stores for the service of his gun, viz.:—boxes of fuzes, fuze keys, cartouches with their wax cloth, tubes, grummet wads, etc., to say nothing of the necessary small implements carried by us in our "small store" boxes, the saddle and box paulins, stable requisites for the mules, etc., all of which go to form such a large percentage of the weight of our ordnance equipment, and which cannot be dispensed with on active service.

The author then goes on to say, that although his tried limit of 272 lbs. is exceeded in the ammunition load by 8 lbs., these boxes are compact, best riding and easiest on the animals, are expendible packs, and that with 7 loads per gun there would be 98 rounds per gun, which may be considered satisfactory both as to number of rounds and of animals required, he considers.

In order to secure the sectional or spherical density obtaining for projectiles of the present date, which alone will secure good ballistic results at battle ranges without undue recoils and strains on gun and carriage, the calibre for a required gun for a 13 lbs. projectile, in his opinion, should be about 2·9", the length of the shrapnel shell without fuze being about 3·25 calibres. Adverse reflections are then made in the article on our screw gun equipment, and we are then

informed that it is proposed to secure even greater power of fire from a gun requiring only 3 mules for its transportation, without any other "relief" than will be afforded by the ordinary spare mules required for the battery, the special allowance for the guns being one each, as, on account of the reasonable weight of the loads, relief will only be required in case of sickness or death of a mule, to be helped out by the aforesaid mules of gunners killed in action.

Commenting on the various forms of shrapnel, Schenck then says, "That for the English mountain gun weighs 7·87 lbs. and contains 100 bullets, 35 to the lb., 70 buck shot, and ten cast iron fragments requiring, at point of burst, a velocity of not less than 660 f.s. to render it effective; it is doubtful whether the buck shot are effective." Now how he arrives at this is not quite clear. We are informed at p. 62 of our Field Artillery drill that 400 f.s. striking velocity is sufficient, and our 2·5" screw gun gives a striking velocity of over 600 f.s. at 4000 yards—an excessive range for Mountain Artillery requirements.

He then continues, "A 13-pounder shrapnel, equally well designed and made, will contain more than 200 bullets and equally effective fragments, the bullets being 34 to the lb., which are probably quite as small as should be used in shrapnel, the weight of the bullet being 206 grains. Bullets 34 to the lb. require a velocity of not less than 646 f.s. to render them effective. To ensure at a range of 3500 yards, a velocity of 646 f.s. for a 2·90", 13 lbs. projectile will require a muzzle velocity of 941 f.s. with an energy at this point of 79 ft. tons, as against 1440 f.s. and 113 ft. tons for the much lighter English projectile." Why? "The heavier shrapnel if properly made will deliver double the number of effective bullets and fragments, and although starting with 34 ft. tons less energy, it will still reach this range of 3500 yards with 12 ft. tons greater energy than the 'high velocity,' but relatively as well as actually, light 2·5" projectile. Such is the penalty enacted by natural laws for neglecting sectional density and exceeding a velocity of 970 f.s. for this class of guns, at about which velocity the law of atmospheric resistance changes so unfavourably for the artillerist."

All this may be quite correct in theory, but I can safely say that the French mountain gun which answers the description most, of this ideal gun of Captain Schenck's, does not on the shooting ground justify the above disadvantageous comparison of our screw gun.

A seventeen years experience of our screw gun equipment has convinced our Mountain Artillery officers of the following:—

- (i.) That it is at present the most serviceable and powerful mountain gun in the world against *personnel*.
- (ii.) That the projectile is ineffective against "*matériel*."
- (iii.) That in its transport we have arrived at the maximum number of animals permissible for the effective mobility of the battery.
- (iv.) That the gun has a comparatively short life and requires careful handling and treatment.
- (v.) That the impossibility of making use of high angle fire is a great defect.

In my opinion, as I have before remarked, we require a general service mountain gun with a projectile similar to that of our Horse Artillery equipment (12-pounder) which shall have an effective striking velocity at 3500 yards, and which will permit of our making use of the advantages of curved fire. This gun may be in two portions, each portion not exceeding 54' in length, and a total weight of not more than 425 lbs. The carriage complete may exceed the weight of the gun by $\frac{1}{3}$ weight of latter. It must not be composed of a larger number of distinct portions than the present equipments (to save greater delay in coming into or out of action). The carriage with all the small stores, etc. must be limited to three mule loads.

As regards the ammunition the following points must be considered:—

At present we carry with the battery 96 rounds per gun in "ammunition line," and 50 per cent. reserve on active service with "baggage line"—a total of 144 rounds. In Italy 74 rounds are carried with the battery, 60 rounds with the ammunition columns, and 150 rounds per gun with the section of park. In the French Mountain Batteries of the Alps 54 rounds per gun are carried with the battery, and 89 rounds by ammunition columns. After a careful consideration of the number of rounds fired by our Mountain Artillery in the different actions in which they have been engaged, I am of opinion that 84 rounds per gun with the battery, and 65 per cent. with the reserve would meet the case. Total number of rounds would not be affected.

The number of rounds must be arranged for each ammunition mule so that we may not have to crowd our fighting line with a greater number of mules in action than necessary. I think it may be conceded that 1 ring shell and 1 case shot might be dispensed with from every mule load (16 rounds), leaving 14 rounds to each mule, or 84 rounds to the six mules allowed at present. Could this be carried in 12-pounder ammunition?

I consider it could by this means:—

- (i.) Reduction of rounds from 16 to 14.
- (ii.) Substitution of cordite in the cartridge.
- (iii.) The abolition of shell plugs and fuze boxes, shell being kept fuze as in Continental Mountain Artillery, detonators being dropped in before ammunition is placed in the box.
- (iv.) Gun bucket to be carried on axle instead of ammunition mule, and weight of harness and ammunition paulins reduced in weight.
- (v.) Pads to be stuffed with cork chips, which have proved most serviceable stuffing after experiments with Mountain Artillery in India.

If a reduction of ammunition is not considered desirable with the battery itself, then the extra ammunition mule per sub-division required with a battery must be obtained without increase of establishment, by reducing the number of bare-back mules in batteries in India

to the number found sufficient for the battery in Natal—18. But great care must be taken to ensure that the spare mules are thoroughly efficient for work, and not, as so often happens, composed partly of remnants too young to work, and partly of mules, old, worn-out, vicious, or unworkable for various reasons.

Captain Schenck disposes of his loads as follows :—

Gun ... ..	...217 lbs....	No. 1 mule.
Carriage and implements	...203 "	No. 2 mule.
2 Baffington spring brakes	32 "	} No. 3 mule.
2 Wheels ... ..	...176 "	
<hr/>		
628 lbs.		

This total weight he considers sufficient to stand up to the energy of his gun. The axle is to be provided with hooks into which an eye on the end if the brake engages. When the packs are made up the brakes go with the wheels, being buckled to the sides of the pack-saddle below the naves of the wheels ; the trail is to be hinged as in the French system. He is against draught under any system, using all our arguments against it. In the following table the Canet gun is mentioned by him. It is not, however, the one adopted by the French service, of which 7 batteries are proceeding to Madagascar.

MOUNTAIN GUNS.

	English.	Austrian.	Canet.	United States 12-pounder.	Schenck's gun.
Calibre, inches	2.50	2.60	2.95	...	2.90
Length, „	70.45	36.28	42.70	37.21	37.21
Weight, lbs.	400	197	218	214	217
Carriage and equipments, lbs.	539	241	324	287	417
Gun and carriage, lbs.	939	438	542	501	628
Wheel, lbs.	108	44.70	48.50	60	88
Wheel, diameter, inches	36	37.40	37	38	36
Track, inches	36	21	26.30	30.28	24
Elevation, +, deg.	25	24	...	9	25
Elevation, —, deg.	15	10	...	7	15
Projectile, lbs.	7.87	6.34	10.14	12	13
M. V., f.s.	1440	...	984	...	941
Pack-saddles and harness. {	Gun	88	56.5	...	55
	Carriage, lbs.	84	58.4	...	55
	Wheel, lbs.	87	...	...	55
	Ammunition, lbs.	86	61.2	...	50
Ammunition box, packed, lbs.	116	84.9	...	116	115
Packs, {	Gun, lbs.	{ 296	...	...	...
	Carriage, lbs.	{ 322	...	268	272
	Wheel, lbs.	{ 306	...	...	258
	Ammunition, lbs.	{ 345	...	...	263
Gun and carriage per ton of energy at one mile, lbs.	{ 317	266	...	...	...
	{ 341	306	...	284 P	280
	26.8	...	13.8	...	11.6

Proposed United States Mountain Artillery Battery Organization of Six 13-Pounder Guns.

	March.		War.	
	Men.	Horses	Men.	Horses
Officers	4	4	5	...
Staff sergeants	3	3	3	3
Sergeants	4	4	6	6
Corporals	8	8	12	12
Artificers	3	3	5	5
Trumpeters	2	2	2	2
Guidon	1	1	1	1
Total enlisted and horses	21	25	29	29
	...	Mules.	...	Mules.
Cannoneers (and muletoers)	48	48	121	109 ¹
Gun, carriage, and wheel pack . . . . .	...	12	...	18
Ammunition . . . . .	...	24	...	42
Baggage, officers . . . . .	...	3	...	4
Baggage, men . . . . .	...	8	...	12
Hospital . . . . .	...	2	...	3
Cooking, rations, &c. . . . .	...	4	...	6
Water . . . . .	...	2	...	3
Stores . . . . .	...	2	...	6
Office . . . . .	...	1	...	1
Artificers . . . . .	...	3	...	5
Charcoal . . . . .	...	1	...	1
Veterinary . . . . .	...	1	...	1
Pioneer . . . . .	...	2	...	3
Spare . . . . .	...	12	...	20
Total, men and mules	69	125	121	234

¹ Not required for Batteries with Infantry.

In conclusion, I think that, had the writer had more experience of Mountain Artillery, he would have found reason to qualify some of his statements. But in theory his paper is an excellent one.

NOTES¹

ON

GERMAN MANŒUVRES, 1894.

BY

COLONEL A. E. TURNER, C.B., A.-A.-G., R.A.

LAST autumn I had the privilege of being in the field for about a fortnight with the 31st German Division during its manœuvres, on the ground on which took place the events of the 4th, 5th, and 6th August, 1870 in the war between Germany and France, as far as the 3rd German Army under the Crown Prince of Prussia and the force under Marshal MacMahon were concerned.

I was present at a night alarm at Weissenburg, followed by a rapid march of the troops in and bivouacked round it, to the Geissberg, whence they repelled an attack on the far side from the town. Four batteries came into action at the "Drei Pappeln," on the position taken up by the guns which were toilsomely dragged up the heights on the 4th August, 1870, when it was found that without artillery the brave French defenders could not be driven out of the chateau.

I also accompanied a brigade pursuing another from Wörth to Sülz, during which advance I had an opportunity of seeing the fine monument to the late Emperor, erected on the spot from which he, as Crown Prince, directed his army at the Battle of Wörth. MacMahon's position on the opposite heights, marked by the tree, now known as "MacMahon's Baum" is clearly visible to the naked eye. I was also present at an attack on Albrechtshäuserhof and the Niederwald, from the direction of Gunstett; and I witnessed a night attack upon a very strongly posted skeleton brigade in the heights between Reichshofen and Eberbach by a strong brigade supposed to be advancing from Bitsche and Niederbronn.

The position was about a mile long and was captured about day-break. As soon as it was light it became manifest that that had happened, which must generally be the case after such an attack. The troops of both sides were intermingled in curious confusion, most of the position was captured, but the defenders in many portions of it held on, long after the troops on either side had been driven far to the rear,

¹ These notes formed the concluding portion of a lecture delivered to the City of London Artillery Volunteers on the 8th February, 1895 on the Battles of Weissenburg and Wörth.

with the result that those who remained were captured from their rear. It seems clear that a successful attack just before dawn must result in the splitting up and utter annihilation of the enemy, owing to the impossibility of conveying orders for a simultaneous retreat when once the two sides are in contact, and the great difficulty of retreating at all in an orderly manner under such circumstances.

The principal event was on the last day of the manœuvres: and I give a translation of the orders for the day to both sides. (*Vide Appendix*). The 11th Corps, as on the day of the battle of Wörth, had taken Morsbronn and Albrechtshäuserhof, it had changed front to the right and had forced the French almost through the Niederwald; its advance was brought to a stand-still on the road in the middle of the Niederwald, and here a hardfight was going on. Its rear was covered by a force on the heights above Eberbach. This force was attacked by a French division supposed to be that of de Failly, which it will be remembered took no part in reality in the battle, but retreated with the stragglers of MacMahon's army, whom it attempted to rally about Niderbronn.

Its attack was successful, Eberbach was taken, and the heights stormed, when the Vorspitze of another German corps appeared at Morsbronn. This ended the manœuvres.

I will conclude by giving an account of the present system of the attack of a position by the Germans, which I saw carried out on many occasions, and which, though no fixed regulations are given for such attack, varied very little.

THE ATTACK OF A GERMAN DIVISION OF 12 BATTALIONS.

The divisional cavalry is thrown out well in front of its division and falls in with the enemy, who is posted in a defensive position, it reconnoitres along his front and round his flanks if possible, and sends in such information as to his position and strength, that the general commanding the division determines to attack him; the cavalry withdraw and take post behind one of the flanks of the division, and the general, in order to cover his deployment and subdue the artillery fire of the defence, sends all his batteries to a position about 2500 yards from the enemy's guns; here the artillery duel commences. When the enemy's fire is somewhat subdued, the guns are pushed forward to about 1800 yards of the position, and at this decisive range, the artillery fire of the defence must be silenced or nearly so. Till this is done, it is considered that an infantry frontal attack has little chance of success. This artillery duel is a long affair, it may be a matter of 2 or 3 hours, but in manœuvres it rarely lasts over an hour. In the meantime the infantry are approaching. The first line consisting of (1) firing line in single rank, extended at intervals of one or more paces in single line march on the designated point of attack, (2) the supports also extended in single line follow at about 250 yards, and (3) the reserve in any convenient formation follow at about the same distance. There is little or no firing till the firing line arrives within about 1000 yards of the position; here it halts for a short time, and the supports close up and reinforce the former, the reserve also diminishing its distance and

extending. The reinforced firing line then moves rapidly forward in one general line, without any rushes, and halts at about 500 yards of the enemy; here the reserves close up, and the now dense line for a few minutes form in a heavy and sustained independent fire. This line appeared to be very dense indeed, but in peace manœuvres it must be borne in mind that there are no casualties to cause the gaps in the ranks, which would be the case in war. In the meantime the rest of the division, with the exception of a small reserve which the commander holds in hand, is split up into companies and gradually advance in single rank with drums beating and fifes playing. They move quite independently and the whole country seemed covered with them, but they all slowly but surely converge in the direction of the point of attack till they are arranged in a sort of formation in many lines opposite the objective or object of attack.

The firing line followed by the rest then moved rapidly forward to 300 yards of the enemy and here a tremendous fire was poured in. The mass in rear then closed on the firing line; suddenly one of its companies followed by the rest, rushed forward and in a minute a huge swarm without apparently any formation rushed upon the enemy, the firing line supporting the assault with a rapid and ceaseless fire; the swarm was at least 30 deep. The guns had in the meantime advanced to about 1100 yards. It is held that when the infantry approach the enemy, artillery from a longer range than this cannot distinguish between friend and foe. It may be said that it is highly dangerous for artillery to approach within such a distance of infantry armed with the present rifles. This would no doubt be the case when the enemy's infantry is unshaken and can devote its attention to the guns. But all its time will be taken up with the infantry of the attack, and under such circumstances, the guns can approach to the nearest ranges. Besides, the artillery is bound to take the same risks as the other troops, and its propinquity gives an enormous amount of confidence to them. If at such a time the guns remain at such a distance that it becomes useless, it does not give the amount of support to its infantry, as the latter has every reason and right to expect from it.

To return to the infantry. The position is captured, and it must be evident that after such an attack all cohesion will be lost, and the units must be all mixed up. This condition of things is constantly practised, and the men fall in under the nearest officers without any regard to their own companies, battalions, or even brigades and divisions.

This was remarkably the case in the attack on the Niederwald which I have described, where various units of the XI. corps were mixed up in an indescribable manner. They were soon formed into cohesive bodies and resumed the forward movement. But while this is going on there is considerable danger of a counter-attack by the infantry: it is the duty of the artillery to guard against this. From its position in rear it is ready to cover a retirement if the assault fails; and on the other hand if it succeeds and the position is captured the guns must be hurried up to crown the position whence it must pour its fire on the beaten enemy, it must prevent his reforming and, if necessary, pursue

him. As we have seen in the Niederwald the guns came up actually in line with the skirmishers and repelled counter-attack after counter-attack on the part of the French.

The Germans do not believe in very long ranges, guns and rifles now carry very far, but after all it is the power of vision of man which must fix the extent of ranges, and firing at long distances means small effect and great waste of ammunition.

Little use was made of cover during the attack, the great object being to press forward as rapidly as possible at all costs and seek a decision at close ranges. It is very difficult indeed to fire with effect at scattered lines advancing rapidly; the men get more and more flurried as the enemy advances, and it takes cool heads to adjust the sights properly and constantly to change them correctly. If you study carefully Part V. of our new infantry drill-book, a most admirable compilation, I think you will recognize that the system of attack there laid down is in letter and spirit very much like the German system, which I have endeavoured to describe.

The marching powers of the men are really very great, the Germans say that the secret of victory lies in the legs of the men, and certainly this was exemplified in the wonderfully long marches of the infantry to the battle-fields of Vionville and Gravelotte. It is the practice of the German army to carry in all work, outside the actual drill field, the full marching order kit, so that the men become quite accustomed to carry it.

One regiment from Heidelberg, which I know well, marched 53 kilometres or about 35 miles as an experiment carrying the new kit, which weighs 26·100 kilogrammes. Not a man fell out. On another occasion I was present with a brigade which rendezvoused at Wörth, and proceeded to Sulz in pursuit of the other brigade of the division which was retiring. Many of the troops had already marched from Reichshofen and Niederbronn to Wörth, which is 16 miles from Sulz; they came up with the enemy first in position about 7 miles from Sulz and after a tough fight drove him back; he took up another strong position on the road to Sulz, from which he was driven, and he then passed Sulz and took up the strongest position of the day, on a ridge beyond the town, from which he delivered a powerful counterstroke which terminated the manœuvre for the day. I accompanied the infantry of the attack all day; they marched much over 20 miles, and forced two strong positions—I can vouch for the fact that not a man fell out. It must be remembered that all the men were very young; very few indeed having more than two years service, which is now the term for the infantry. No one could desire to command better soldiers. The two years' men were for the first time discharged after the manœuvres last year. In 1893 many German officers told me that it was a mistake to introduce the two years' service law in place of the three. But last autumn the same officers told me that they had been mistaken, and they had found that it was quite possible to make a thorough infantry soldier in two years. The men worked better, knowing that they would return to their homes in two instead of three years. Naturally it entailed more work on the officers and under-

officers, but in Germany both these work in earnest.

Smokeless powder was used to a great extent. This gives a very great advantage to the troops of the defence, as it is much more difficult now to discover their positions owing to the absence of smoke. In the case of artillery it enables the intervals of the guns to be very much reduced where the ground is cramped and confined. The Germans however never reduce these intervals if it can be avoided, owing to the clearer target presented to the enemy. I once saw four batteries massed in action, and the intervals were less than half. The gunners and drivers were armed with revolvers; this I think is wise, if cavalry can get within charging distance, say a mile, of guns, they will if resolutely led assuredly get among them, and then unless the escort of the guns is strong enough or other troops at hands, the men of the battery are at the mercy of the enemy's horsemen. There is no powerful case or grapeshot now as at Waterloo. Thus in the war of 1866 3 squadrons of the 5th Prussian Cuirassiers charged on 20 Austrian guns and took them nearly all.

At Vionville on the extreme German left, north of Mars-la-Tour, the French *Chasseurs d'Afrique* charged a battery of Horse Artillery and held it for a few minutes till the German 11th Hussars drove them off. The men of the battery took shelter behind the wheels and carriages and defended themselves with revolvers; they suffered but little loss. At the same battle Bredow's brigade of the 7th Cuirassiers and Uhlans in their celebrated charge rode through the French batteries and cut down many of the gunners and drivers.

APPENDIX.

MANŒUVRES OF THE 31ST DIVISION OF THE 24TH SEPTEMBER, 1894.

EASTERN ARMY.

SKELETON ENEMY.

Special Idea:—

At daybreak the Eastern Army attacked the enemy, who was in position on the left bank of the Sauer above Wörth.

The 11th Corps has advanced from Dürrenbach and Gunstett and has driven the enemy out of Morsbronn, Lausberg (Albrechtshäuserhof), has occupied the heights west of these places, and has taken Eberbach. The main body of the corps has pursued the retreating enemy into the Niederwald, where a severe struggle ensued, with the result that the victorious progress of the 11th Corps is brought to a standstill on the high road leading from Eberbach to Spachbach and Wörth.

Four batteries crown the heights between Morsbronn and the Niederwald, but after the capture of Eberbach, they have no objective to fire at.

General von Röcklin's Infantry Brigade has occupied Eberbach and the small

woods south-east of it with three battalions. Two flag battalions hold Albrechtshäuserhof; three battalions (1 flag) and two squadrons are posted at Morsbronn. The pioneers have thrown several additional bridges over the Sauer.

The 14th Army Corps is expected from the direction of Walburg.

General von Röcklin, under whose command all available troops south of the Niederwald are placed is held responsible for securing the safety of the rear of the troops fighting in the Niederwald against any reserves which the enemy may bring up.

Troops at his disposal :—

Staff of the 61st Infantry Brigade.
 Infantry Regiment 126th.
 1st Battalion 137th Regiment.
 3rd Battalion 138th Regiment.
 5 Squadrons 15th Dragoons.
 5 Squadrons 15th Uhlans.
 3rd Abtheilung of the 31st.
 Field Artillery Regiment reinforced by a Field Battery.
 Pioneer Battalion No. 19, with the exception of 1 company.

Remarks :—

1. It is supposed that two flag battalions of the 126th Regiment hold Albrechtshäuserhof, and 1 flag battalion from the 3rd battalion 138th Regiment, Morsbronn; while 2 and 3 companies 19th Pioneer battalion represent three flag battalions and hold the western exit of Walburg in a position under cover with flags unrolled: upon the appearance of the latter who represent the advance of the 14th Army Corps, the General commanding will give special orders, on his own initiative.

Each flag battalion will be represented by a detachment under the command of an officer, equal in strength to a section, and will be marked with a red flag.

2. The fight of the main body of the 11th Corps in the Niederwald north of Eberbach will be marked by means of red and blue flags. The men representing the Eastern Army will wear helmet covers and carry red flags; those representing the Western will have no helmet covers and carry blue flags.
3. The skeleton enemy with blue flags should take up the positions assigned to them by 7 a.m.; where they will remain with piled arms till 7.30 a.m.
4. The Pioneers should increase the means of crossing the Sauer according to present requirements. To carry out this the 19th Pioneer Battalion, less 1 company, has been available since 9 p.m. on the 22nd.
5. All further dispositions for the marked enemy and for the position of the blue flags are to be made by General von Röcklin.
6. The commencement of the manœuvres, *i.e.* the advance into the theatre of operations at 7.30 a.m.

WESTERN ARMY.

31st DIVISION.

Special Idea :—

A battle is going on on the banks of the Sauer both above and below Wörth.

The 31st Infantry Division and the 31st Cavalry Brigade is standing in reserve about 1000 metres west of Schirlenhof.

An officer of the General Staff brings an order to the General commanding the

above troops to move in the direction of Gunstett, and to drive the troops of the enemy, who are pushing forward on the south side of the Niederwald, back over the Sauer; then to wheel to the left and join vigorously in the fight in the Niederwald.

He gives the following directions :—

The enemy has seized all the passages across the Sauer : on the other hand our positions on the crests of the heights east of Nehweiler, Froschweiler and Elsasshausen have so far been victoriously maintained in face of repeated attacks by very superior forces.

Advancing from Dürrenbach and Gunstett the enemy has occupied for more than two hours Morsbronn, and Lausberg (Albrechtshäuserhof). Our right wing has been hurled back in a north-westerly direction into Niederwald, while Eberbach, after being cannonaded by several (4 or 5) batteries from the heights between Morsbronn and the Niederwald, has also been lost.

In the Niederwald the battle appears to have come to a standstill on the high road Eberbach—Spachbach and Wörth.

Troops :—

61st Infantry Brigade.
 132nd Infantry Regiment.
 138th Infantry Regiment (less the 3rd Battalion).
 62nd Infantry Brigade.
 60th Infantry Regiment.
 137th Infantry Regiment (less the 1st Battalion).
 31st Cavalry Brigade.
 15th Uhlan Regiment } (less 5 squadrons).
 15th Dragoon Regiment. }
 Field Artillery Regiment No. 31 (less the 3rd Abtheilung
 and 1 Field Battery).
 19th Pioneer Battalion, 1 Company.

Remarks :—

1. The enemy's troops (with helmet covers) are partly in full strength and partly skeleton which are represented as follows :—

- (a.) A battalion by a detachment and a red flag, (this is a departure from the rule so far during the Autumn manœuvres).
- (b.) A battery by a gun with a yellow flag.
- (c.) A squadron by a detachment with a white flag.

Blue flags mark the extremities of the flanks of the troops already engaged with the enemy ; our own without helmet covers, the enemy's with.

2. The operations commence at 7.30.



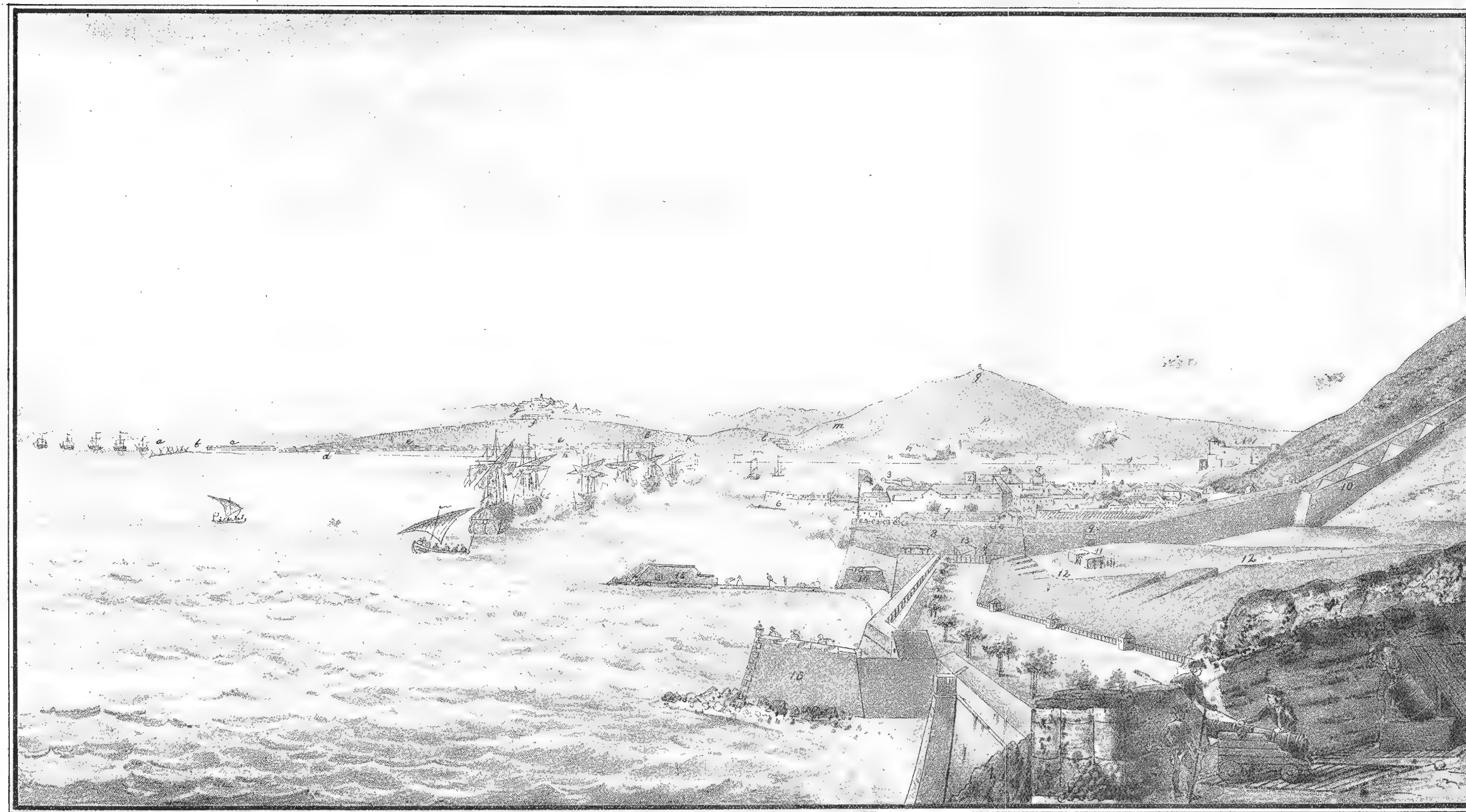
REFERENCES.

- (a) The Orange Grove.
- (b) Point Negro.
- (c) The Spanish Hospital.
- (d) The Enemies' Fascine Park.
- (e) The Spanish Camp.
- (f) The Duc de Crillons quarters.
- (g) The Town of St. Roch.
- (h) Grand Park of Artillery.
- (i) Tessier's Battery.
- (k) Camp of the Grenadiers of Ireland.
- (l) Camp of the Catalanes.
- (m) Neapolitan Brigade.
- (n) Bateria del Rey.
- (o) Stone quarry.
- (p) French Brigade.
- (q) Queen of Spain's Chair.
- (r) St. Felipe
- (s) Infanta, Battery of 7 Guns

Part of the
Spanish Lines.

REFERENCES TO THE WORKS, &c. OF THE GARRISON.

- No.
- (1) The Old Moorish Castle.
 - (2) The White Convent.
 - (3) The Old Mole.
 - (4) The Governor's Quarters,
 - (5) The Spanish Church.
 - (6) The King's Bastion.
 - (7) The Grand Store.
 - (8) The South Bastion.
 - (9) South Port.
 - (10) The Citadel.
 - (11) The Fascine Park.
 - (12) The Princess of Wales's Lines.
 - (13) Ragg'd Staff.
 - (14) Lunette.
 - (15) Ragged Staff Head.
 - (16) Eight Gun Battery.



View of the Grand Attack on the Garrison of Gibraltar on the 13th Sept., 1782,

From a Water Colour by CAPTAIN THOMAS HISLOP, 39th Regiment of Foot, in the possession of the R.A. Institution.



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SIEGE OF GIBRALTAR.

BY

BREVET-LIEUTENANT-COLONEL J. ADYE, R.A.

The great Siege of Gibraltar as related in a manuscript diary kept throughout the siege by Captain Spilsbury, 12th Foot, an officer of the garrison, and hitherto unpublished.

THERE are few if any military operations in English history in which the Royal Artillery has borne a more important or distinguished part than the defence of Gibraltar during the great siege of 1779–1783, and any records of this defence must possess undoubted interest for officers and men of the Regiment.

Fortunately such records are fairly numerous, and the pages of the best known account—that of Drinkwater—contain much detailed information of considerable value.

In his excellent history of the Regiment the late Colonel Duncan devotes a chapter, written with his usual charm of style, to this important struggle, and gives much information about the conduct of the artillery part of the defence.

Such information must necessarily have more interest for those who have a personal knowledge of the Rock—fortunately a large portion of the Regiment—and who may perhaps have carried out practice from some of the batteries constructed during the siege and named, as they often are, after individuals who have been distinguished in the history of Gibraltar.

A short time ago a most interesting volume dealing entirely with the great siege was brought to my notice, and I at once saw that it would prove a valuable addition to the already existing chronicles of that period, for it purported to be an original manuscript diary kept by an officer who was present throughout the siege, and who illustrated his written diary by numerous water-colour and pen and ink sketches.

This diary, which was presented to the Gibraltar Garrison Library not long ago by a descendant of the writer of it, has never, I believe, been published, but had remained in the custody of the diarist's family in its original manuscript form for over a hundred years.

On reading it through attentively it seemed to me so interesting as well as so quaint in its expression and wording as to warrant the reproduction of parts of it. I accordingly communicated most of the more interesting portions to the local paper—the *Gibraltar Chronicle*—in a series of twelve short articles which appeared once a week from the 3rd of September to the 19th of November 1894, with such brief notes and comments as I was able to add.

It then suggested itself to me that many of the extracts, especially those dealing with the Royal Artillery, would perhaps have sufficient interest to bear their reproduction in the "Proceedings" of the Royal Artillery Institution, hence the following pages which do not of course pretend to any originality but are merely a reprint of some of the more curious or more interesting entries in the journal.

The writer—Captain Spilsbury—was not an artilleryman, but belonged to the 12th Foot, but the great interest he evidently took in all artillery matters and the details he gives regarding them make it probable that he—like so many infantry officers—was told off to assist the artillery in their very arduous duties.

One very satisfactory point about his diary is the remarkable way in which it almost invariably agrees with Drinkwater's history, even to the smallest details—indeed I cannot help thinking that the better known writer may have had the advantage of perusing Captain Spilsbury's account before publishing his history.

But Drinkwater's more sober pages do not possess the naïveté and sarcasm of some of Spilsbury's remarks, and so thoroughly characteristic a diary is not often seen.

It has an added attraction in the many painstaking and accurate drawings accompanying it, drawings which may not perhaps possess great artistic merit, but are certainly very faithful pictures of the bay, the surrounding country, the enemy's ships, works and approaches, our own guns, howitzers and carriages, and many other things connected with the siege.

Besides these sketches there are tables, some of great interest, giving heights and distances about the Rock, soundings in the bay, nature and number of ordnance mounted or rounds fired both by the attack and the defence.

I have not confined myself to artillery matters only but have given some extracts which are of general interest by reason of the importance of the events they narrate or of the language and sentiments of the writer.

Before commencing the extracts from the diary it may be of interest if I give a few particulars as to the garrison of the Rock and the Royal Artillery at that period, and for these particulars I have drawn upon well known authorities, such as Duncan, Drinkwater, &c.

The Royal Regiment of Artillery in the year in which the siege commenced—1779—consisted of 32 *Service* and 8 *Invalid* companies, which were augmented at the end of the year by the addition of 2 more *Invalid* companies. Sixteen of the service companies were in America, one in Newfoundland, three in the West Indies, three in Minorca, and five in Gibraltar, leaving but four of the whole thirty-two at home. The five companies at Gibraltar were the five senior companies of the 2nd Battalion, and were commanded by Colonel Godwin¹ when the siege commenced, but on his coming to England in 1780 the command passed to Colonel Tovey² who died during the night of the great sortie, 27th

¹ Kane's List, No. 66.

² Kane's List, No. 92.

November, 1781 and was succeeded by Major Lewis.¹

The strength of the artillery was 25 officers, and 460 non-commissioned officers and men who had to work the following armament which was mounted by the end of the siege :—

Guns.	Mortars.	Howitzers.
77 32 pounders. 122 24 and 26 pounders. 70 12 pounders. 16 9 pounders. 25 6 pounders. 38 3 and 4 pounders.	29 13 inch. 1 10 inch. 6 8 inch. 34 smaller natures.	19 10 inch. 9 8 inch.
348 Guns.	70 Mortars.	28 Howitzers.

A total of 446 pieces of ordnance, or nearly as many guns, &c. as there were gunners.

The expenditure of ammunition between September 1779 and February 1783 was 57,163 shot, 129,151 shell, 12,681 grape, 926 carcasses, 679 light balls—or 200,600 rounds and about 8000 barrels of powder. The enemy's expenditure from April 12th 1781, to February 2nd 1783,—the period of their greatest activity—is said to have been 175,741 shot, and 68,363 shell, or 244,104 rounds in all, “agreeable to the laboratory accounts,” as Drinkwater says, while the Spanish gun-boats threw 4283 projectiles to the 4728 from our gun-boats.

The artillery losses were—killed 23, died of wounds 8, totally disabled 13, wounded 116, died of sickness 36 = 196, a percentage of 40 on the total strength.

The original garrison of the Rock numbered 5382 men, consisting of Artillery, Engineers, a company of Artificers, the 12th, 39th, 56th, and 58th Regiments of the Line, and a Hanoverian Brigade, comprising Hardenberg's, Reden's, and De la Motte's regiments. They were reinforced in 1780 by the 73rd Highlanders (over 1000 strong), in 1781 by 700 of the 97th Regiment, and in 1782 by 1600 men of the 25th and 59th Regiments.

We now come to the diary itself, on the fly-leaf of which, written in the neat running hand which characterises the whole contents, is the following :—

“CAPTAIN JOHN SPILSBURY'S JOURNAL OF THE GREAT SIEGE.”

“This Journal was kept by Captain Jno. Spilsbury, 12th Regiment Foot, who remained in Gibraltar from 1st March, 1776, to 10th November, 1783.”

The first entry in the diary is dated June 21st, 1779, and the last November 10th, 1783. The very first entry runs thus :—

“21st June, 1779.—This day the communication is shut with Spain, the Guards are reinforced and Grand Battery made a Captain's Night Guard, the Picquets are ordered to lie accoutred, with their arms loaded. No one to pass at Landport but Workmen, Engineers, &c.,

¹ Kane's List, No. 176.

and in Case of an Alarm the Town Regiments to Line the Wall of the Town, and those of the Southward to form on their Parades."

Various other entries relate to the precautions to be observed and the early measures taken during the Siege, the most curious of which is perhaps—

"*21st July.*—The Guards to mount without Powder in their Hair."

We shall see presently how the writer accounts for the disposal of the said powder.

"*5th August.*—People employed making three Batteries, one above Willis's and two below it, also in making an Encamp Ground for about 600 men just above the Devil's Gap, where a mortar is planted, and in making Bomb Proofs in the Wax Yard."

Willis's, it may be explained, was then, as it is now, the name given to a group of batteries looking north across the Neutral Ground, and at some height up the Rock.

There is now a battery at Devil's Gap.

"*29th August.*—Our Men of War's Boats go out now and then, but are always either too soon or too late. The Admiral continues to live on shore."

"*12th September.*—Green's Lodgement being finished, which is about 900 feet above the level of the Isthmus, Willis's, &c., began firing on the Spanish Lines about $\frac{1}{2}$ past 6 a.m., and made very bad practice—the Dons had several working parties there, and had last night thrown up a Fascine Battery to the Eastward of their common entrance. The Devil's Tower Guard called in before the firing."

The writer always speaks of the besiegers as "the Dons," never as "the Spaniards" or "the enemy."

The Devil's Tower is a tower still standing just below the perpendicular face of rock on the North Front.

"*14th September.*—The Batteries fire as usual, they hit the Forts of Phillip and Barbara, &c., frequently but do them little damage, nor are they likely to be knocked down, so much the boast of the Artillery; but on September 30th we find "The Officers of the Artillery receive double pay."

"*16th September.*—Two Shells from the Sea Mortar at Willis's fired with 33 lb. of Powder burst in leaving the Mortar but one with 28 lb. fell and burst about half-way between Fort Phillip and their Encampment, about 3500 yards. 24 Pounders mounted at Green's Lodge."

"*24th September.*—A duck and a small plumb-pudding cost 7 shillings."

"*29th September.*—The Dons have raised a parapet from Fort Philip to the Corporal's Guard and from thence seem to cover themselves towards their Laboratory Tents at the Foot of the Queen of Spain's Chair, so cautiously do they act on all occasions. They have erected a Stage at the Orange Grove for landing their Stores. Mortars seen there."

These names are still in use and indeed Spilsbury very rarely employs a name whether of a place on the Rock or in Spain, that is not in common use at this day. We now come to a very curious entry—

3rd October.—One 58th man was overheard saying that if the Spaniards came damn him that would not join them. The Governor said he must be mad and ordered his Head to be shaved, to be blistered, bled, sent to the Provost on bread and water, wear a tight waistcoat, and to be prayed for in Church."

Unfortunately we are not informed if this extensive and peculiar treatment restored the 58th man to sanity.

6th October.—Road making to the Rock Guard—failed in getting a 24 Pounder up by Ropes. Nothing to be seen Offensive in the Spanish Lines, except some Traverses of Fascines and a Covered Way from the Entrance towards their Encampment."

On October 9th we read "The gun is got up to the Rock Guard;" and on the 13th "The Rock Gun is fired."

The "Rock Gun" is situated at the high point at the extreme north end of the Rock—some 1330 feet high.

14th October.—The Sailor's Battery in the Navy Yard is watched to keep people from walking on the Platforms which being made of Clay sinks in when wet very deep, the Engineer late Master of the Ad. has a Cob a day for making it."

15th October.—Charged 7 shillings sterling for a Dinner of Salt Beef, and little bit of Fish and Pudding."

26th October.—The Navy pick the Fish-Boats and spoil the market," is his querulous complaint, and on any question of food he is very touchy, as we shall presently see."

27th October.—Geese at a guinea each and ducks at two dollars. Traverses are building up the Main Street," is his odd entry.

4th November.—The Dons have opened three Batteries in the Lines two of 14 Guns and one of 7 and have raised their Parapet very high in several Places. An officer and 40 men to join the Lines Guard. The Guns at All's Well fired several times, and otherwise much firing."

5th November.—The Artillery have not fired these 48 hours, and are now not to fire till they see something to fire at," which looks as if they had, up till then, been in the habit of letting off their guns promiscuously in the hope of an occasional ball finding its billet.

7th November.—Nineteen shillings given for a Pig's Head. The Governor does not care how dear things are, but he has left off treating with Hock and Claret. Traversing platforms seem to be quite in vogue," a most curious mixture of information that reads very delightfully.

8th November.—Method of reporting for repair of Quarters to the Chief Engineer altered—so no more partiality."

Then on the 9th November.

"The Governor seems desirous to have as many Gardens made as possible, he has tried what a man can subsist on, and lived himself for 8 days on 4 oz. of rice per day, so that without a supply we are like to know within a grain or two what we are able to do. Some of his Horses in bad trim, and wear no shoes, he files their feet."

Finally we culminate on November 12th with—

"It seems the Governor has bought up all the Hair Powder, and eats

Puddings made of it. Veal sells at 2 guineas per quarter."

"*22nd November.*—A Ten Inch Howitzer was fired and found to carry as far with about 5lb. powder, as a 13 Inch Mortar that requires 9 or 10."

A little later we read that "the above Howitzer at 39 Degrees Elevation throws to Fort Barbara with only 2lb. 10 oz. of Powder, is of a new Construction, few of them only are in the Garrison."

Presently we read that "Mr. Boyd, Carpenter, constructed a Gin with which to mount a Gun."

On December 1st he has the following amusing entry: "Some of the Artillery so careless as to make use of a Magazine as a Guard Room."

The British Gunner is proverbially a careless person, but he perhaps excelled himself in that respect in this instance.

On December 2nd:—"A mule on the works strayed to the Spanish Lines"; and on the 4th "A Parley, and the mule sent back."

Here is a quaint experiment in Artillery practice.

"*11th December.*—Tried if a shell would go further from a Height or upon a Level which proved in the former. It was thought here that a shell went straight forward from the Piece to the end of the Progressive Force and then fell perpendicularly down."

Where *was* the Gunnery Instructor?

"*14th December.*—A Deserter killed and hanged by them, a Dragoon in pursuit of him was knocked off his Horse by one of our Guns and lay some time but afterwards got up and walked away."

Practice at a moving target was evidently well understood by our Artillery if they hit a dragoon on the wing, but the efficacy of their fire is rather discounted by the fact that the dragoon afterwards got up and walked away, unless Spanish dragoons were made of particularly hard material a hundred years ago.

"*19th December.*—The Donsexercised small arm and fired a good deal. Vessels not to be fired at unless within the distance of 6 Degrees Elevation."

"*12th January, 1780.*—Forts Barbara and Phillip fired several shots at our waggons going to the Devil's Tower for stone, one came to the French Parade through a House and fell in the street and wounded a woman—to the great surprise of everyone who did not think they could throw a shot so far."

"*26th January.*—A shot came near the Demi Bastion from their Morning Gun at Point Malo." This is probably what is now known as the Hesse Demi Bastion flanking the Grand Battery at the entrance to the Fortress.

Punta Mala is about 4,000 yards distant from the Demi Bastion.

In January 1780 arrived Admiral Rodney's fleet with provisions for the garrison—not before they were wanted—and the surrender from starvation which at one time seemed not impossible was averted.

The diary for the next few months contains little of special Artillery interest, and most of it is devoted to the price of food, scarcity or otherwise of provisions, and the health of the garrison.

A new excitement was to arise however in June 1780. It is thus noted by Captain Spilsbury.

June 7th, Wednesday, Wind about N.W. "About 2 a.m. came the Fire Ships, one a 2 Decker, the others 9 in all, some Frigates, other small Craft, appeared near the Enterprise and answered Swedes, but on being fired at were set on Fire and burnt most furiously, our Sailors steered them clear of the New Mole for which they were steering: six fell on the Rocks from Rosia to Europa, and the other 3 were carried by the Current burning to the Eastward."

"8th June.—The Sailors employed in geting in the Bottoms of the F. Ships and seling them for Fuel."

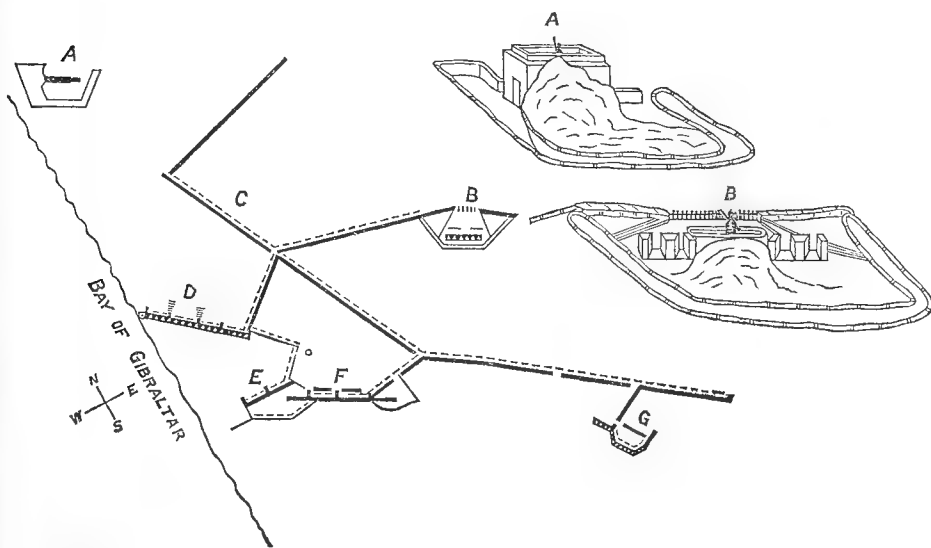
"24th June.—A 70 Gun Ship, the St. Michael, 2 Frigates and a Xebeck coming near Europa were fired at, which they returned and fired many broad sides at the Rock and Shipping and threw several Shot on shore. The Enterprise had 19 men burnt and wounded by their own bad Management."

The entry of the 29th August is a curious one.

This day remarkable for the death of one Colonel and Trial of another. Colonel M — and Colonel R —, the latter tried for attempting to depretiate Genl. B — in the eyes of his Regiment. Arrived a boat from Mr. Logie in Barbary. A Duel between 2 Officers 1 wounded. Salt Pork 2½ Reals p. lb. Salt Beef 1 Real 12 Qts."

The 1st of October 1780 was a day of some importance because it was then that the Mill battery was begun by the Spaniards on the Neutral Ground, a battery that afterwards caused a good deal of annoyance to the Garrison, and was destroyed in the sortie of the 27th November, 1781.

There were at one time two Towers on the isthmus, the Devil's Tower which still exists, and the Mill Tower near the Western beach 1100 yards distant from the Grand Battery and destroyed by fire from the Rock during the Siege. Captain Spilsbury marks this tower in a sketch of these advanced works, which is inserted at this point in the Diary, and it was doubtless from it that the Mill Battery was named.



A The West Guard House. B The Middle Guard House. C The Approaches. D The 13 Gun Battery. E The Empetrardo Battery. F The Mill Battery. G The Mahon Battery.

"*1st October (Sunday).*—About 2 a.m. the Dons erected the first of the Mill Battery and set fire to the Huts and Canes in the Gardens, and hung fire Machines on the Palisadoes of Bayside and Forbes's, and set fire to the latter but the Guard put it out. The Dons advanced under cover of heaps of dung, Rubbish, &c. that have long been let to remain before these outposts; the guards fired several shots, but the Dons hid themselves immediately—in short those are bad works and were badly managed."

"*9th October.*—Queen's Lines making. The Rubbish &c. leveled before Bayside and Forbes's and the large Stones broke and the Holes filled up to prevent the Dons secreting themselves there, and Casks put up by way of Breastwork within the Palisadoes, but after all a miserable work and poor invention."

"*26th October.*—Last night the advanced work made as big again. Much firing on our side."

"*19th November.*—Last night the Gun Boats came again and on our firing an Iron 32 Pr. on the King's Bastion it burst and killed one of the Artillery and wounded three other men of different Regts:—several large pieces flew about the Town."

"*26th November.*—They have begun their approaches to the advanced work from their Lines, and have fired small arms and drove in our gardeners, and the Gun Boats have drove in our men of war to the New Mole and most of their Vessels are gone to the Westward."

"*20th December.*—Arrived the Speedwell King's Cutter with Dispatches, but no News, great secrecy at Head Quarters."

"Last night the Water run in such Floods at Willis's that one of the Gunners was carried down by it and broke his Thigh."

"The Marksmen have mounted Guard for some time at the Lines, and fire frequently on the Dons at work, but they make game of them."

The year 1871 opened unfavourably for the besieged Garrison of Gibraltar, for the Emperor of Morocco had been induced to let his three ports of Tetuan, Tangier and Larache to the Spaniards, with the result that the supplies from that country, on which Gibraltar so largely depended, were cut off, and the English Consuls and many of the English inhabitants of those places were obliged to leave.

"*23rd January.*—A 13 Inch Mortar mounted on the highest part of the N. Rock on a Swivel Platform, and answers very well. Yesterday a Sergeant of the 56th deserted from Lower Forbesses Guard, and one Hardenberg deserted down the back of the Rock, and the Master of St. Firming killed himself by drinking."

"*28th January.*—The Governor has given gratuities for having fired and kept a good look out, and now they fire pretty often."

"*30th January.*—Tried a gun at 2, 4, and 5 Degrees elevation lashed so as not to recoil, and again unlashed and free, when the latter went the farthest. At 2 degrees it ricocheed 6 times and went farther than at 5 degrees when it ricocheed only twice."

"*26th February.*—Several experiments made on Platforms of Guns and Mortars. One by laying Junk with a Spindle in the Centre by

which the Bed goes on a Swivel and answers very well."

On March 7th he says :—"The 8 Inch Howitzer broke the Swivel Pin, but the $4\frac{3}{4}$ stands 8 lb. of Powder."

"6th April.—Fired three 13 Inch Shells from the Rock Mortar at the advanced work, 2 of which struck on the Parapet and damaged it much."

Food had gradually been getting scarcer, and entries in the diary make constant mention of rising prices, but on April 12th a fleet under Admiral Darby escorting a large convoy arrived in the Bay. Spilsbury's entry runs—

"About 11 a.m. arrived the Convoy, about 130 sail, of which 28 of the Line, 4 or 5 Frigates, a Fire Ship, Cutter, &c. being preceded in the night before by the Kite Cutter, who brought despatches that were immediately taken to the Governor, and about $\frac{1}{4}$ after just as the leading ship dropped her Anchor their Batteries began Bombarding the Town which they kept up, resting only in the middle of the day for their Siesto."

On the 15th we find this entry. "Such a scene of drunkenness, debauchery, and destruction was hardly ever seen before," the result of the arrival not only of food and stores but of wine and rum.

It was on this day that the besiegers commenced their bombardment of Gibraltar which went on with but slight intermission for many months.

Presently we read—

"27th April.—The traverses not shot proof and several men wounded, &c., in the South Flank King's Bastion. The magazine was in that Flank but shifted a day or two ago."

The number of ordnance bearing on the place at this time is given by Drinkwater as 114—guns and mortars.

"15th May.—The Mill Battery fired three shells, one Middle Yard South Barracks, one near the Old and Grand Magazine Rosia, and the other to near St. Michael's Cave."

The Spaniards had constructed some gunboats with which at about this time they commenced to harrass the Garrison, and their fire from their land batteries increased also, so that much damage was done to the town, and many people killed.

The following entry gives a fair idea of the horrors of the bombardment.

"24th May.—About midnight a shell fell into a House South Shed and buried about 16 people for 2 or 3 Hours, but they were got out by the Assistance of the Picquet except a Child belonging to the poor woman 58th that was killed some time ago, which perished by it. Three Jews, one that had lost all he had in town, near 10,000 Pounds, his clerk, and a Relation a woman were killed by a shell in their House in Black Town, and 2 Butchers, inhabitants, were killed and one wounded and one 73rd was killed in his Bed in S. Barracks. Two shells fell in the Hospital Yard, and a shot went through the Roof of the pavilion at the Hospital where Lt. Lowe was. Our batteries were manned but did not fire.

Not a bad record of disaster for 24 hours.

"*4th June.*—Hoisted the Royal Standard, and the Dons fired a great deal at it, and sent one shot through it. At 1 p.m. our North Front fired a Round from Right to Left at the Mill Battery, but only shewed the Dons they could hardly hit it."

"*9th June.*—About 11 a.m. the Laboratory of the Dons took fire and blew up, with a great number of Loaded Shells, &c."

In order to counteract the effect of the enemy's gun boats the Governor caused some prames or gun boats to be constructed at about this time, and to be moored within range of our guns, but at a sufficient distance to keep the enemy's gun boats from coming close in. Drinkwater says that two brigs were cut down to form these prames, one of which was called the Vanguard, carried two Spanish 26 pounders two 12-prs and was rigged like a settee; and at the end of his diary Captain Spilsbury gives coloured drawings of this boat and the Repulse, and also the Fortune which was cut down to a prame later in the year.

His entry referring to it is—

"*21st June.*—One of our Gun Boats or Prames finished, and carries four 26 prs. and two 12 prs."

Another development of the defence devised about this time was the construction of a battery at the end of the old Mole from which the enemy's camp could be shelled. The annoyance this work caused the Spaniards made them name it the "Devil's tongue" battery—and as such it is known to this day.

Its armament consisted of a 13 inch sea service mortar fired with a charge of 28½ to 30 lbs. of powder, and five 32 pounders and one 18 pounder sunk in the sand at an angle of 42°, and using charges of fourteen and nine pounds of powder respectively. Spilsbury says—

"*27th June.*—All ready at the old Mole for throwing shot and Shells into the Spanish Camp."

This battery was first fired on June 28th and produced an excellent effect.

Here is an experiment :—

"*7th July.*—Tried the Strength of Powder, when a difference of 40 or 50 yards was found in two ounces of different Powder dried against undried."

Here is another very curious entry :—

"*15th July.*—The Jews' Burying Ground dug up in the night by Captain W—— Artillery and made a garden of."

"*16th July.*—The Dons now and then return a shot but reluctantly, our Batteries tease them."

"One 12th that had had his Thigh broke by a shell came out of the Hospital yesterday, got Drunk and broke it again."

"*19th July.*—The Merlons Queen's Battery Willis's Cassoned and finished last night, and the Dons have not fired at it."

"*20th July.*—The Dons saluted us from the Lines with 28 or 9 shots, and fired a Feu de Joie, from the Camp, Island, Shipping, Gun Boats,

&c., the whole three times over, a very pleasing sight." It would have been less pleasing, we imagine, had the rounds been ball.

"22nd June.—A duel 3 Pistols each between the Major and Adjutant, — Regt."

"1st August.—Found that the most Powder makes the shell burst closer and in most pieces."

"14th August.—Several of the Gun Boats gone to the second River, where they repair and careen them."

The hospital seems to have suffered very severely from the fire of the enemy's gun boats, and there are constant entries relating the damage done and the casualties incurred there. Perhaps the most thrilling of these is related in the following extract, which is confirmed by Drinkwater :—

"28th August.—About 1 a.m. came the Gun Boats, 16th time, and fired shells only. One fell" (in the) "Artillery ward on the Bed of a man that was wounded before, and burnt for some time. He called for assistance but none dared give it him ; it burst, carried off one Leg, broke the Thigh of the other, and burnt him much, he died some time after," and Drinkwater adds "His last words were expressive of regret that he had not been killed on the batteries"—a proper sentiment for a Gunner.

The same day Captain Spilsbury writes :—

"Verbal and private orders given out, so that Officers are stopped by Centries without knowing they are wrong."

"31st August.—An experiment—wooden Ramrods against the Sailors' Rope one, but the wooden ones remain in practice." This no doubt refers to rammers for the heavy guns.

"12th September.—The Shell that fell on the Magazine in the Moorish Castle, Eastern Side, S.E. angle made a Hole in bursting &c. that held Six Thousand filled sand Bags of a Bushel each, and went six Inches into the old work of which the Arch &c. is 7 feet thick."

"16th September.—A shell fell up the Rock and roled down to the Northernmost Gun Princess of Wales's Lines and bursting fired it off. This is the 3rd gun that has been fired in that manner since the firing began."

At times Captain Spilsbury waxes rather sarcastic, but as he hits all round, from the Governor downwards, we must not resent his remarks. Here he has a hit at the Royal Artillery.

"27th September.—It seems the Governor has given leave to the Artillery to exert themselves, only instead of knocking down Fort Barbara, which was their first boast, to prevent them from covering the merlons, even which they are not able to do, two of them being covered already."

"29th September.—The Rock mortar split by a shell's bursting in it, which is contrary to the given opinion. It seems Cradles are not sufficiently provided for the Hospital, nor places to perform Surgical operations in, the Wards where the sick are, are all they have, the others being Inhabited by Families, &c. The H. Doctors are little better than

Butchers, and ours are not trusted with medicines. When Major B. was wounded no proper dressings were at the Main Guard, where a Mate attends, the Director being accused of it next morning, answered there were, having sent them just before at daylight."

"*2nd October.*—The Enemy fired about 2,000 rounds last night. Every gun that could bear kept going."

"*6th October.*—The Dons fire now at our working parties, from ten to twenty guns at a time, yet we continue to have about 200 men at work on the Hill perfectly exposed, when half the number, well attended, would do more work, and not be in one another's way."

"Some cows killed on the Hill, when a shell falls they go and smell to it."

"*12th October.*—The gunner that fired the Rock Mortar when it burst is dead, having broke a blood vessel in his head," and another, "A drummer of the 12th punished for beating two Surgeon's mates," and again "The officers of Artillery dine with the Governor the day they come off guard."

"*16th October.*—It seems a remarkable circumstance happened on the 10th instant. A gun on Montagu" (Montagu Bastion) "being loaded with a shell, and a hole as usual bored in the cartridge for the priming it was fired with a Tube, and the contents shell and all fell on the Glacis Waterport, the shell having got fire lay a short time and burst, but the Cartridge was taken up untouched by the Fire, and reported to the Governor."

The above statement can, I fear, scarcely be swallowed by a gunner.

A few days later we read "The men have only one or two nights in bed," which shows how hard the duty was at this period.

On the 25th October the daily entry concludes with "The officers riot a little."

"*29th October.*—On complaint that the sick have not Room enough at the Hospital all the Interlopers are turned out, but the Governor's Housekeeper; the Doctor B. is not to have a whole ward to himself."

"*6th November.*—A man or two that came with the Boats are taken up as spies, and one a native of Gibr. has confessed he was sent here for that purpose. The Line Wall about Montagu and the Demi Bastions very much damaged by their shot, and our men in the Works do anything but work. Old Junk has been hung over the Batteries and has preserved them very much."

"*19th November.*—The Dons throw long Rangers now from the Mill Batty. all about the South Barracks."

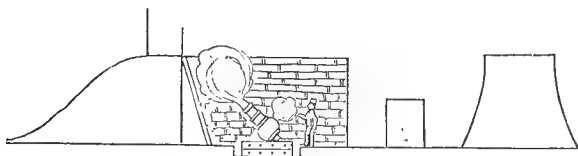
"*21st November.*—The Dons continue their long Rangers, and the splinters fly all about even to Bona Vista."

We now come to one of the most important and perhaps the most remarkable event of the siege—the celebrated and successful sortie of November 27th 1781.

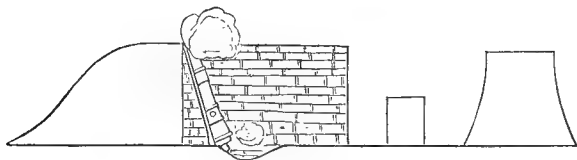
Captain Spilsbury's entry is unfortunately a very meagre one, which is odd from one who paid so much attention to trivial details, and whose regiment was actively engaged. From the way he words it it would

appear that he did not take part in the sortie. He redeems his omissions with the pen by his use of the pencil and the brush, for he not only gives an excellent and apparently very correct plan of the North Front, the Gardens, and the enemy's works, but he adds a coloured table showing the disposition of each regiment, corps, and detachment, the order of their attack and the numbers of men engaged. These numbers agree in every respect with those given by Drinkwater.

In a corner of this coloured plate—the colours of which are as bright as if painted yesterday—are two admirably drawn coloured representations of sections through the enemy's two principal works, the Mill Battery and Empetrardo Battery, showing the positions of a gun and a mortar in the act of being fired at high angles of elevation from behind cover.



Section through the Mill Battery.



Section through the Empetrardo Battery.

This is his entry for the day.

About 12 last nt. a detachment of the Garrison assembled on the Red Sands, and waited for the Moon's going down at about 3 a.m. when they marched out at Land Port under Command of the Governor by the name of Brigr. Ross; and attacked, burnt, and destroyed the Dons' new and advanced Batteries, and returned to their Quarters before daylight with loss of only 4 killed and 17 wounded, and 1 missing, Rhedens. One 12th, two Hardenbergs, and one 73rd killed. Lieut. Tweedy 12th, 4 sailors, and a Sergt. 39th wounded. Two officers were brought in with 10 Privates prisoners."

The Royal Artillery taking part in this bold and admirably executed affair numbered 114 of all ranks—and while they were playing their part in the action—that of spiking the guns, destroying the magazines, and firing the works, their commanding officer, Colonel Tovey, was dying in Gibraltar. The command was then assumed by Major Lewis.

Captain Spilsbury writes, on the following day:—

"At about 3 a.m. the work still on Fire, and some of the loaded shells going off. The Don's threw up a Rocket and continued an incessant fire Cannon, small arms, &c. on the work for the space of an Hour supposing our second attack."

"4th December.—A Flag of Truce, with some things for the prisoners with the Walloon's Compliments and Thanks for our care of them. The Spaniards put from 13 to 18 lbs. of Powder into their 13 Inch

Mortars to reach the Town from their Lines, and from 22 to 26, for their long Rangers, but their lb. is heavier than Ours.

Their Patroles come very near since the Sortée."

"5th December.—The Dons have picketted out a work in the Front of the Old M. Battery." Mill Battery no doubt. The besiegers lost no time in reconstructing their works, and their progress was rapid, but no doubt the moral effect of the Sortie was great in both camps.

"6th December.—No officer of the Line to presume to interfere in pointing a gun or give directions concerning it, but when on Guard if found necessary, they are to apply to the Artillery, who are there for that purpose."

The last entry in 1781 is as follows:—

"29th December.—Last nt. died the Baron Helmstatt, Ensign in the Walloon Guards with the Rank of Captain and lost his Leg at the Mill Battery when taken Prisoner. A Flag of Truce to send his Body to the Camp, and it was escorted by the Grenadier Compy. 12th Regt. to the New Mole, where they fired 3 Rounds over it."

"1st January, 1782.—Our people are putting up the Cassons of Princess Ann's Battery, Willis's, before which they expose a curtain which the Dons have fired at."

"1st February.—Several stone Balls of different sizes found in the Ruins of the Moorish Castle, and Cells all over the yard. Fired Lieut. Koyler's¹ depress Gun Carriage which answers from the Heights."

This carriage² was one invented by Lieut. Koehler, R.A., for firing from high sites at angles of considerable depression, up to 70° in fact. A description of it is to be found in Drinkwater's history of the Siege, and Spilsbury gives several sketches of it.

"4th February.—Our batteries are repairing with Ship Timber like Port Holes. They are making small Ditches in the Front of their Works, in case of another Sortée."

The following figures are for the year 1781.

"10th February.—The Dons computed expence of ammunition Shot 102,034; Shells 28,943. Powder about 16,000 Barrels, a cwt. each.

Our expence of Ammunition.

About 1952 Barrels of Powder, and 46,010 Rounds of Shot, Shells, &c.

"17th February.—About 1 a.m. a small Brig from Ireland came off Europa and tho' desired frequently to anchor near the other shiping she came to back Old Mole, and drove on shore—the Dons have fired about 300 shots at her. The Master deserved hanging for destroying other People's property."

"4th March.—It appears the Governor has ordered the Artillery not to make Reports or Returns to the Lieut.-Governor."

"29th March.—The Dons have blown off some of their guns, advanced work, and appear to be making a Lodgement by the Devil's Town, and running a Communication to it from the Mill Battery."

¹ Kane's List, No. 605.

²A picture of this gun was given in No. 6, Vol. 14, R.A.I. "Proceedings" and the Institution possesses two original pictures of the gun signed by Koehler.—A.J.A.

"18th April.—The Dons have made a great number of Traverses, and a work about half way across the Isthmus for small Arms."

"16th May.—About 6 a.m. the Charles, Elianora and Charlotte Store Ships standing for the Bay were spoke to by the Spanish Gun Boats, and hoisted French Colours and appeared to stand for Algazeras, but when left to themselves they hoisted English Colours, and came safe in. The Dons saw their mistake and did what they could to intercept them but were too late. They brought about 2,000 Barrels of Powder and shells for 32 pounder guns."

"29th May.—Lieut. Whetham 58th to do duty with the Artillery when he chuses and to command next to an officer."

A very interesting period of the siege is that now about to commence. It had been evident for some time that a determined effort was about to be made to reduce the place, and great preparations were going on in the Spanish Lines and along the shore. A certain Chevalier d'Arçon had devised a scheme early in the year by which he thought Gibraltar might be taken. It consisted in attacking it from the sea by bombproof boats.

"*Incombustibles et insubmersibles*" as their French inventor claimed them to be. In appearance they seem to have resembled Noah's Ark, or the popular idea of that ancient ship—and their wooden roofs were permeated with water by an ingenious arrangement of pipes. It was claimed that no shot—not even a red-hot one—could set them on fire, and as the wood work was very thick they could not be penetrated. I have read a very interesting pamphlet written by the Chevalier in his defence and published in Cadiz in 1783. A copy of it is now in the Gibraltar library.

Spilsbury gives several carefully drawn pictures of these curious vessels. Besides the Chevalier several other distinguished persons joined the besieger's camp about this period eager to witness the closing scene in that long-protracted drama "The Siege of Gibraltar."

On our side we had not been idle. Lieut.-General Boyd—the Lieutenant Governor of the place—had conceived the idea that red-hot shot would be most efficacious against the enemy's gunboats—whether modelled on d'Arçon's plan or not, and furnaces were constructed in large numbers, some of which may yet be seen on the Rock. Another great addition to the strength of the fortress was commenced about this time in the shape of the rock cut galleries first suggested by Sergt. Ince. Curiously enough Spilsbury first mentions both these developments of the defence in the same entry—that for June 7th 1782, it runs thus—

"In practising red hot shot from the King's Bastion, one man was blown to pieces and 3 wounded. 2 Briggs from the eastward alarmed the whole Tribe of the Dons. A Gallery is Blasting in the North Face of the Rock above Willis's to get to the Hook or a prominent piece of Rock, to make a Batty. there, one man is killed and 2 wounded."

This undoubtedly refers to the Upper Galleries, and the "Hook" is probably what we now know as St. George's Hall.

"11th June.—About 10 a.m. an expense magazine Princess Ann's Battery, Willis's blew up by a shell from the Dons, about 100 Barrels

of Powder were in it. About 5 men were blown down into the Lines, 30 men were killed and wounded of which 15 are lost to the service. The Dons Huzaa'd and kept up a heavy fire ; its explosion burst open the doors of the other Magazines. The officers' servants go on Fatigue work, the Regiments not being able to find their Quota of Men."

"*26th June.*—Stone Balls are made and a hole bored in them to hold about 2 oz. Powder, and they answered the purpose of shells."

Some reinforcements arrived at about this date for the enemy who began to be very active. Spilsbury notes that they began their ninth Junk ship, and on June 27th he says: "Between 2 and 3 a.m. some officers of the enemy came to under Forbesses and being challenged from the Queen's Lines, they desired the Captain 58th, not to fire and run off, a Court of enquiry of 5 Lt.-Colonels to sit upon it."

"*2nd July.*—A Xebeck going out was fired at by the Store ships, she returned a shot or two but they hardly reached as far as the Place where the Store ships' shot fell, so ridiculous do we make ourselves at times. The Dons are raising a kind of Roof over their Junk ships, by way of Bomb or Splinter Proof."

Here is a mention of the celebrated Sergeant Ince.

"*4th July.*—Sergeant Ince's gallery going on well. 13 men in about 5 weeks have cut about 82 feet long by 8 feet high and broad in the solid Rock North Face."

"*10th July.*—Some of the Stone Shells are very heavy and have a Colly flower head coming out of the Mortar."

"*12th July.*—One 73rd told his Dream and pretends fore knowledge, that this Place will be taken in 3 weeks after it is attacked.

"The men have a number of stories among themselves, but their allowance of Grog is drank before night, and they are obliged to go to Bed sober, so no wonder they have disagreeable dreams. 4 gallons of Grog only to be sold by each Wine House per day." The idea that sobriety leads to bad dreams is a strange one. Spilsbury does not relate the sequel to this soldier's dream, which was that he was taken to the provost ship to await the expiration of the period he named, and then be flogged.

Here is a delightful note.

"*6th August.*—The Germans conduct themselves very differently from our Young People, for though Young, and even Buckish, they never appear in any Riot, or in doing anything that can bear the least Censure, how different their Education."

This evidently refers to the men of the Hanoverian regiments in the garrison.

"*19th August.*—Sergeant Ince has got 165 feet into the Rock and has made two Embrasures, but his people have got the Disorder. A Flag of Truce with a present of Game, Fruit, &c., for the Governor, Lt. G." (probably Lieut.-Governor) "and Commodore, and a Packet of Letters for some Inhabitants brought by the Count d'Artois come as a volunteer for the siege."

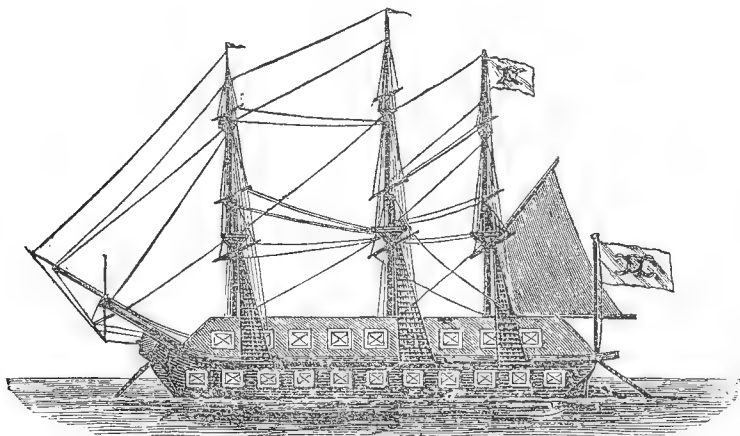
"*29th August.*—Ince's Gallery 200 feet long and has two 24 pounders mounted there. All our Prames come into the Mole and the Boom is

continued from the Tank to the 8 Gun Battery. 6 of the Junk ships are hauled out, and the Deserter says about the 15th of next month, the Dons will be ready."

The deserter was quite right. The long threatened attack from which so much was expected was at last about to take place, and on the 13th of September 1782 exactly a hundred years before the battle of Tel-el-Kebir (13th September 1882), the bomb ships, ten in number, were anchored off the King's Bastion, and the action commenced. Spilsbury gives particulars of the preliminary actions as follows:

"8th September.—At 7 a.m. by the Lt. Governor's desire our Battys. began their utmost fire of Red hot Shot &c. on their advanced works, kept it up till 4 p.m., and destroyed the Mahon Battery."

The list of Guards and Picquets given by the diarist agrees in most particulars with that given by Drinkwater, and added to it are pictures of the enemy's Junk Ships, and our own Gunboats and Prames. Very carefully drawn are these ships, notably the representation of the "Pastora Junk Ship—Don Buena Ventura Morena—Admiral."



Pastora Junk Ship—Don Buena Ventura Morena—Admiral.

On the 9th September the besiegers made a signal and commenced a heavy fire from all their works, while their "Admiral with five ships of the line stood within gun and fired at the vessels and garrison, one or two shot came on shore, but they made themselves very ridiculous."

"About 6 P.M. about 15 Gun Boats came and attacked the King's Bastion, but being within Grape Shot they stayed only half an hour."

This attack was continued the next day, and Spilsbury says—"It was ridiculous enough to see one of the ships put about whilst firing, and the men at some of the guns not being informed of it kept firing the same guns, being then the contrary way."

He adds: "According to our calculation they fired in the first 24 hours about 6,000 shot and shells."

On the 11th of September the heavy firing continued and Spilsbury calculates that the enemy fired 120 to 200 rounds per hour during the

night, and set on fire the palisades at Bayside.

On the 12th he writes: "About 1 a.m. came the Gun Boats &c. and staid till 3. They have a Mortar Battery at the East End of the 64" (the 64 gun battery of the besiegers lay north-east of the gardens on the North Front about the centre of the Neutral Ground according to a plan he gives of it, and appears to have had two long divisions in it containing respectively 42 and 22 embrasures) "to play on the Rock Gun, and they divide their fire at the heights and Grand Battery, shot by day, shells by night. About noon arrived in the Bay a Fleet of about 40 and odd Sail of the Line, French and Spaniards with a few Transports &c. so that the Bay is nearly full of them."

His entry for the 13th of September, the day on which the great attack was made, runs as follows:—

"Last night the Dons threw from about 70 to 130 shells per Hour, and several People wounded &c. About $\frac{1}{2}$ past 9 a.m. Ten Junk Ships came and anchored off the King's Bastion, and to the northward at a Distance of about 1000 yards, but 2 of them remained further off than the Rest, they were commanded by a Rear-Admiral, and fired a great deal into the water, that being a new way of making Breaches. They appear Rigged like Polaises. The Brilliant and Porcupine scuttled. Kilns having been erected to heat the shot, about noon we began to fire them. About 5 P.M. one of the Junk Ships apparently on fire, and about midnight they ceased firing and were most of them in Flames, having thrown up signals of Distress three or four Hours before, and gave our gun boats a fine opportunity, had they chose to have profited by it. Their Batteries kept a very heavy fire on the Town, &c., and the Extremity of the Lines East End of the Queen's Battery at Willis's and Caroline's are rendered almost useless, and the Line Wall from the Demi Bastion to Montagu's much wounded, with the merlons of Grand Battery and the King's Bastion. The Remains of the Houses knocked about and the Town full of Rubbish. A Bomb Ketch anchored without the Junk Ships and kept firing on the Town. Captain Reeves¹ Artillery lost his arm and died, Captain Groves² of do. burnt by an ammunition Chest blowing up, Lieuts. Godfrey³ and Whetham wounded."

The entry for the 14th is a very long one, the longest apparently in the whole diary. It commences: "About midnight our Gun Boats got out and began firing on the Junk Ships. About 4 a.m. three of the J. Ships blew up, our G. Boats having been on board and brought what they could, wounded men, &c., away. About 10 a.m. two more blew up, in short, all are blown up, except two that burnt down, and one that there is hopes of saving. Numbers of the Spaniards were blown up in Vessels, some that would not leave them, and others that were so wounded they could not get out. The Prisoners are 12 Officers and 344 men." He continues: "The Colours of the Admiral, who was Morino, were brought to the South Parade, and exposed, to the ex-

¹ Kane's List, No. 427.

² Kane's List, No. 187.

³ Kane's List, No. 608.

treme satisfaction of those who but yesterday felt rather heavy at the Awfulness of their appearance. The Dons kept up a heavy fire on our Boats while they were saving the unfortunate objects, they had left in the Learch." The garrison loss in the two days is given as one Captain, 2 Serjts. and 14 Privates killed, and 3 Captains, 2 Lieuts., 1 Serjt., 2 Drummers, and 78 Privates wounded. Among the bodies found in the wrecks was that of a priest. Spilsbury adds—"Notwithstanding this Juncture our Workmen Labour as though they were paid for being Idle," and he calculates that from batteries and ships about 40,000 rounds were fired in the 24 hours, a somewhat liberal estimate surely. He relates that the Gunners in our batteries were so exhausted that they drank the water in the buckets in which the sponges were washed, and that had it not been for some Companies of the 39th and 72nd, the batteries would have been silenced before the middle of the night for want of men to work the guns.

"15th September.—It appears the Junk Ships had about 166 guns and 5,000 men on board when they began the attack. How differently the sailors are treated from our People—the soldiers—they are generally served Grog at their guns, but ours were at their guns and carrying ammunition four and twenty Hours without a bit or drop, except some water that the officers took from some of the working men."

With the successful repulse of the great attack of September 13th, 1782, the efforts of the besiegers gradually fell off, and no really serious attack was subsequently made; although, for a time, it was feared. The prisoners taken by the garrison were placed in charge of the Corsicans at Windmill Hill, as Captain Spilsbury relates:—

"16th September, 1782.—The Prisoners are now allowed to be spoke to, but not except by Officers. The Corsicans have charge of the Prisoners, they are armed with a Firelock, Bayonet, and Pistol."

On the 19th he makes the following observation:—"The Artillery not pleased with what was said to them by the Governor."

On October 2nd, Captain Spilsbury gives a list of the enemy's ships that took part in the attack of the 13th, and as it differs in certain particulars from that given by Drinkwater I append it.

He calls it a "List of the Junk Ships destroyed by the Garrison September 13th, 1782." Drinkwater, whose list of names is identical, calls them "the battering ships."

Names.	Guns.	Men.	Commanders.
Pastora.....	26	700	Don Buena Ventura Morena, Admiral.
Talla Pedra	26	700	Don Juan Mendoza.
San Frans. de Paula	26	700	Don Cayetano Languara.
Paula Secundo	9	280	Don Pablo de Casa.
Rosario.....	32	700	Don Ramon de Villa.
San Christovas	10	300	Don Fred. Gravino.
Princessa Carlos.....	11	350	Don Antonio Bassura.
San Juan	10	300	Don Joseph Archiocha.
Santa Anna.....	10	280	Don Joseph Angeli.
El Dolores	6	250	Don Pedro Sanchez.
Total...	166	4500	

He appends a note "taken from the Boatswain 1st Paula," that is, from the Boatswain of the 3rd ship on the list.

Their mortar boats continued to bombard the Rock at night, and they fired also from their Lines, generally commencing before sunrise and continuing till noon when they desisted for what Spilsbury calls their "Siesto."

On the 3rd of October he says that the Commodore and Secretary went on board a Spanish frigate under a flag of truce, and on the 4th he writes: "The Commodore and Secretary gone to dine with the Duke, and to settle the Cartel."

"6th October.—Jones' Gallery has had one man killed in it by a shot come in at a Port, and the communication Kings' Lines has had 3."

The enemy's camp was now diminishing but a deserter who came in on November 4th reported 11,000 men there. On the same day is this entry:—"Received Bât and Forage money a Capt. 40 Pounds."

"9th December.—About noon a 32 Pr. gun on a new carriage elevated at 45° fired shells and about $\frac{1}{2}$ over the Bay, or about 5,000 yards." On December 17th we read, "A Flag of Truce. Peace talked of."

The last year of this remarkable siege commenced on January 1st, 1783, the entry for which date runs as follows:—"One of the guns of the Junk Ships being got on shore it was drawn from Ragged Staff to the Mole Parade, where it had the Spanish Colours fixed on the Carriage and then drawn to the New Mole Battery attended by the Musick of the 12th Regiment—playing God Save the King. It is a very plain Iron 26 Pdr.—9 feet 6 inches long, and about 5 feet in the Chace." On the next day we read "One of the Brass Guns of the J. Ships brought to Ragged Staff nearly 6 feet in the Chace; and 4 feet 8 inches in the Breach, a 32 lb. shot goes into it, but it has been run in the firing. The make seems to be French Idea, but badly Imitated. It has its name, viz. Brazen Face." He later gives particulars of another captured Brass gun, "the Bellicoso."

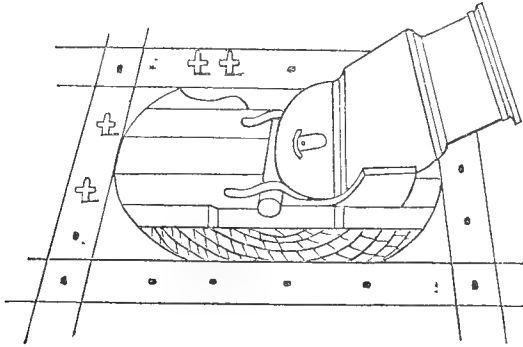
"12th January.—The Old Mole fires a 24 pr. grape every half hour during the night at Bayside Guard House, and the other Battys. keep up a constant fire on the Istmus."

"14th January.—Jones' Gallery 370 feet long, has 6 Embrasures and 4 guns mounted in it, also a good covered way up to it."

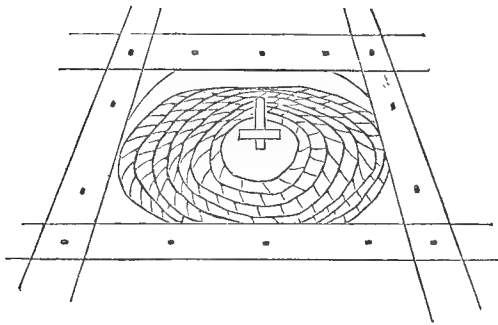
"19th January.—The officers have acted a Play, Cross Purposes, and true Blue." But on the 22nd we read "The officers' Playing put an End to by the Governor." On February 4th Spilsbury gives a list of Casualties from 12th April, 1781 to 3rd February, 1783 as follows:—"Killed 6 Officers, 24 Sergeants, 4 Drummers, 275 Rank and File. Wounded 32 Officers, 2 Surgeons, 70 Sergeants, 15 Drummers, 959 Rank and File," and he adds a table of shot and shell supposed to be fired by the enemy during that time, differentiating between Gun boats and batteries in each year. The total is 182,516 shot, and 75,861 shell.

Several very carefully drawn sketches are interleaved here, chiefly of

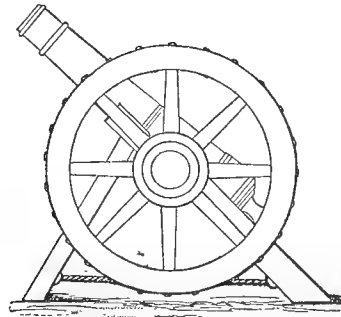
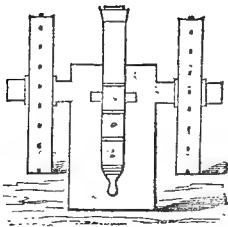
guns, mortars, and carriages. They include, a gun on a traversing platform, the Rock Mortar, a Swivle Platform, Lieut. K's. Depress Carriage, Col. W's Empetrardo Carriage, a Depress Mortar Carriage and others.



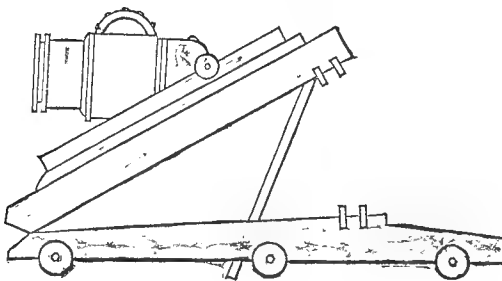
Rock Mortar.



Swivle Platform.



Col. W's Empetrardo Carriage.



Depress Mortar Carriage.

The near approach of the concluding act of the Great Siege is indicated by the entry for February 5th, 1783, which runs thus:—

“A Flag of Truce from them, and we are given to understand there is a Peace.”

“*22nd February.*—The Dons employed carrying away their artillery from their advanced works. Writing paper, the first we have had for some time at 5 Reals per Quire.” One wonders whether the paper on which the Diary is written was some of this paper.

On March 4th there is an entry as to the desertion of a Bombardier of the Artillery from Willis's. This is the first mention of the desertion of an Artilleryman we have come across in the Diary. A little later we read:—“The Artillery at exercise every day, learning to march”; they had probably had more important duties to perform during the preceding 3 or 4 years.

The Duc de Crillon paid a visit to the fortress on March 31st, and this is Captain Spilsbury's account of it:—

“About 10 a.m. the Duke de Crillon came into the Garrison attended by 5 officers, 2 Dragoons, servants, &c., he was saluted 17 guns from Grand Battery, and had a Captain's Guard. All the Officers were presented to him at the Convent by Corps. The men were all dressed as for Sunday, and the 73rd wore their Plaids &c. and the streets were so crowded they could hardly pass, the soldiers cheering all the way he went. After seeing Willis's and Ince's Gallery, he dined at the Convent, and had all the Brigadiers and Staff to attend him, after which he went round Europa &c., the Regiments falling in as he passed, and returned about 8 P.M. through Landport when the same Salute was fired as at his Entrance.”

The work in our Galleries still went on, as is shown by several entries, among others the following:—

“*19th April.*—Nine Embrasures are now made in Ince's Cave, and one is made under the Queen's Battery at Willis's, and the whole going on. It appears that our Engineers have been out and seen their advanced works and some even into Fort Phillip, and that the Dons have been extremely civil, but this is done as it were underhand for the orders on both sides are still against the Communications being opened.” Two days later, we read that “Several officers have been out to the Spanish works, St. Rock, Algazeras, &c.”

For some time past we read of great preparations being made for the investiture of General Elliott with the Order of the Bath, and on April 23rd, St. George's Day, the ceremony took place and is thus described by Spilsbury, the whole of whose entry we give on account of its amusing character.

“About 9 a.m. The Governor came on the Red Sands where a Detachment from each Corps of the Garrison was drawn up in two Lines, opposite the Center of which he read a Letter thanking them for their services and then his own Thanks. The whole Saluted and the Artillery who were drawn up in Front of the Left wing fired 21 guns, and a Round from the Troops by way of running Fire, then the Guns as before, 3 running fire 3 times and then 3 cheers.

“Afterwards the streets were Lined and the Procession went from the Convent to the Collonade on the King’s Bastion, General Boyd as King’s Commissioner, and after the Ribband was put on, The Grenadiers that followed the Procession fired, and then the Guns from right to left of the Bastion, from Hesse’s Batty. to the Flat Bastion Included. The Field Officers, &c., and Staff dined at the Convent, and the Soldiers, &c., have a Bottle of Wine and a Pound of Fresh Beef each, gratis, so that the Captains and Subalterns are the only ones not taken notice of in this day’s Entertainment. At about Dusk the Lamps were lighted in the Colonade, but were blown out in general except those in the Center Arch, and there being no musick all seemed extremely dull, or like Ranelagh or some of the publick Places deserted. About 9 P.M. the Fireworks were exhibited, but it rained at times very hard and of course did them no service, but they were too much of a sameness to have been good at any Rate, except the Sun and the Rockets that answered very well. At last the rain coming through the Canvas the Spectators were obliged to seek shelter in the best manner they could, and to conclude, the Gates at Southport being shut, and the wickets left open, such a mob gathered there that some Lives were in danger of being lost, there being nothing but a scene of confusion, fighting, &c., till the Gates could be got open and the whole dispersed, it seems the Guard threatened to fire at them but were only laughed at, in short some of the C—” (? Colonels or Captains) “had made a little top free with the Bottle, and were hardly able to manage themselves much less a mob they had so perfectly contrived to set together by the Ears, but it turned out to be all of a Piece. Never was a worse salute performed by Artillery; they not being able to fire a salute of 21 Guns, from 6 they had in the Field, two of them being so neglected as to have a shot in each left at the bottom before the Loading was put in, and their Tubes were in General too long. A worse Feu de Joye fired by Troops, worse weather, worse musick, worse fireworks, or worse Entertainment.”

It is quite evident that General Elliott made a great mistake when he omitted to feed the Captains and Subalterns, and no doubt had he been aware that one of the former was taking notes in so adverse a spirit, and that they would eventually be published more than a century later he would have taken steps to propitiate his Chronicler, whose entry is at once so amusing and so characteristic.

We may take this ceremony as fitly closing the Great Siege of Gibraltar which lasted three years, seven months, and twelve days from the commencement of the Blockade to the Cessation of Arms. There are no more entries in Captain Spilsbury’s diary which very directly concern the Siege save an account of a visit he paid to the Spanish Lines which may be noted here :

“29th April, 1783.—Having the Governor’s leave, which is now asked for by the Commanding Officers, who did not venture to ask it before, to go out at Land Port, stroled to the Spanish advanced works, from one end to the other they have a Sergt’s Guard and some Centries who hesitated at our going in. They are from 9 to 12 Fascines high well faced with sand sandbags etc., and full of Travesses, but the Timbers

are now all taking away. Their Magazines and Guard Houses are well constructed being slopes of Timber against the Fascine work, well covered with thick Plank or rather Timbers, the former, of which they had many, were well ramed with clay and sandbags and held only about 8 Barrels of Powder each, made up in Cartridges which they brought every night. The Communication betwixt the Batteries had a Banquet about half way from the Top to the Bottom and 4 or 5 Fascines broad for the men to be drawn up on and very easy to be got down or assaulted, their ditches in their Front were all lined with Fascines, but were soon filled with sand as we could see long ago. The Empetrardo Battery had six guns, fixed on a kind of wooden Mortar Bed sunk very deep in the ground. The floor of their works or batteries was all ramed Clay, very hard, and easily kept free from sand. The sleepers of the Mortar Platforms were about 7 inches thick of which they were 3 deep well put together and ramed with Clay, their splinter proofs were chiefly in the Mortar Batteries which were well Traversed and very high, the other splinter proofs in the branches were very slender but covered over with daubed canvas apparently to keep out the Rain, and if one may judge from circumstances their People though in the Trenches were not nearly so exposed as ours either to the weather or even the enemy. They allow having had 1200 killed and 400 disabled, but the chief of their loss must have been at the times their works were on fire (for the working parties always shifted from the place they saw us, when we did fire, fire at) which is surprizing did not happen oftener from their being so crowded with Fascines, but the red hot shot were much wanted, our shells chiefly 13 Inch being too heavy and sunk too deep into the sand, want of 10 Inch for that service, and our very small ones could only annoy the Patroles and Straglers. Their Mortar Beds are much smaller than ours, or one cut horizontally through the center."

Other interesting Artillery items are—

"*11th May.*—Ince's gallery has 10 Embrasures and an air hole broke out, and is about 600 and odd feet long, the 9th Chamber or Cave is large enough for a Guard Room, has 2 doors and is tolerably dry."

"*3rd June.*—Ince's gallery got to within a few yards of the notch, and a gallery is now making to it on the outside from the furthest Embrasure."

"*18th July.*—Most of the Junkship guns are expected to be got up. An Algerine dives and slings them."

Such is the contemporary chronicle of the Great Siege—one of the greatest in history, as written by one who took an active part in the defence. From certain signs I think that the actual diary before me was probably not written up day by day during the siege, but was written out afterwards from notes taken no doubt on the spot and afterwards brought into the form of a journal.

Whether this is the case or not I think that everyone must agree that this diary is of very great interest both for historians and for military men, and especially I think for gunners, whose arm of necessity played so conspicuous a part in the defence.

The many references to Artillery matters made by Captain Spilsbury

—an infantry officer—testify to the important share the Artillery had in the successful defence, but I have ventured to transcribe other entries than those referring to Artillery—some of them because they treat of important events, and others because of their quaintness of expression or meaning.

Readers of the diary will probably agree that we can apply to it what Drinkwater says of his own historical record, namely :

“I have been reduced to greater accuracy and minuteness than ordinary historians are obliged to observe ; and instead of the acuteness of investigation, or a splendid sententiousness, I have been necessitated to pursue the narrative, almost uninterruptedly, in the tedious form of a Journal. I have not presumed to intersperse many animadversions of my own : the only merit to which I can lay any claim, is that of a faithful narration of facts ; and, I confess, I would at any time rather walk in the beaten track of truth, than mislead the judgement of my readers in the wilds of fancy and conjecture.”

The singularly exact manner in which Spilsbury's narrative agrees with that of Drinkwater—the acknowledged historian of the siege—leads one to the gratifying conclusion that both writers succeeded in keeping to the “beaten track of truth,” and therefore lends considerable interest and historical value to the diary of the former which after considerably more than a century is now brought to the light. It is hoped that this interest may be considered sufficient excuse for the publication of the foregoing extracts from Captain Spilsbury's diary in the “Proceedings” of the Royal Artillery Institution.



ON MAGAZINE REGULATIONS.

COMMUNICATED BY THE

DEPUTY-ASSISTANT-ADJUTANT-GENERAL, R.A.

(1.) The following amendment to "Regulations for Magazines, &c.," 1894, will shortly be published or included in the next revise of that work:—

Part II., section II., paragraph 223 (b) :

"Filled cartridges, in groups which will be as far as possible, identical in nature and age. *The age of the cartridges to be reckoned from date of filling and grouped by years. If there is a sufficient number of cartridges of the same lot, they may be grouped separately.*"

(2.) The numbering of the groups according to dates of receipt or age, is intended to serve a double purpose :

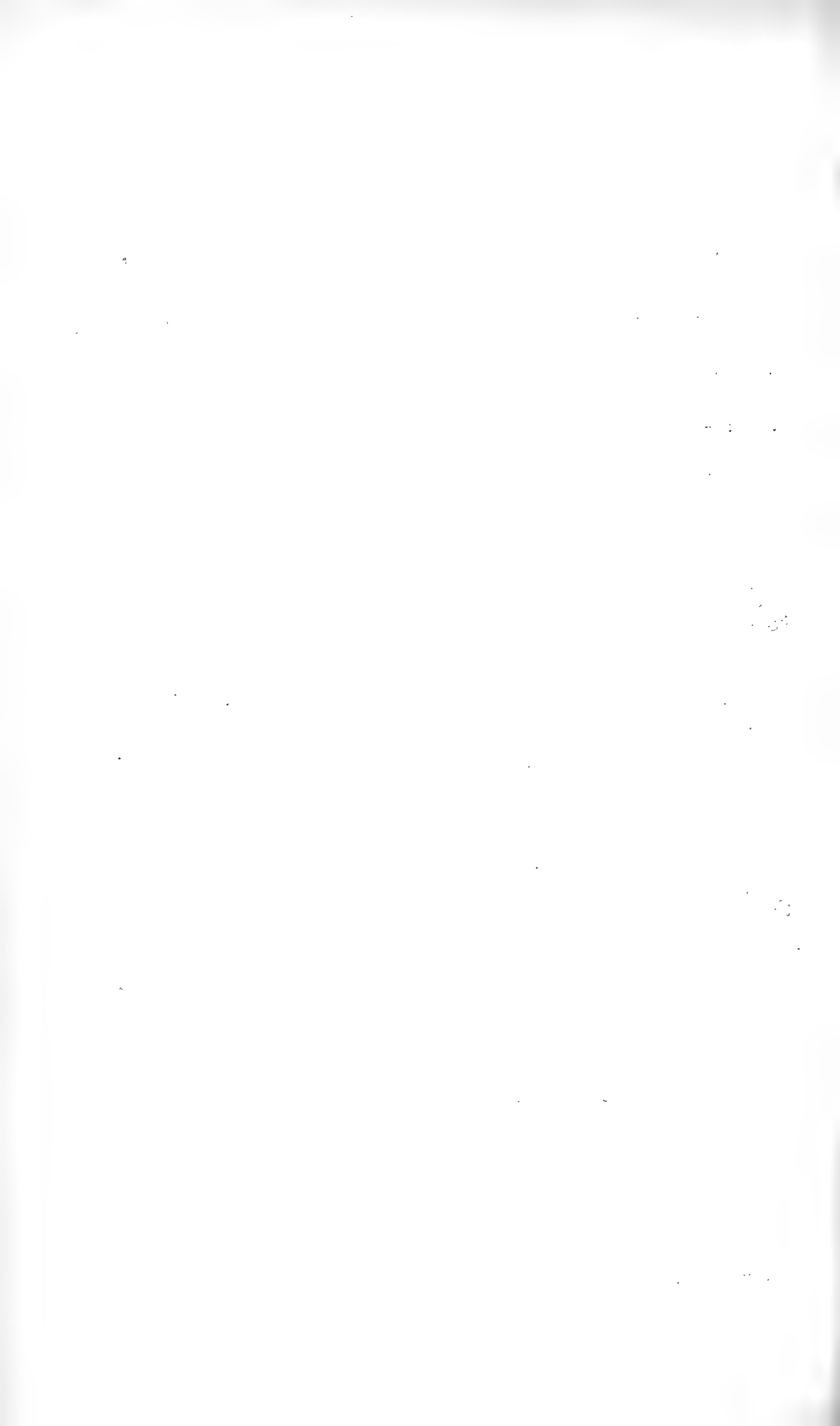
(a) To ensure a reasonable amount of uniformity in shooting in each series.

(b) To secure the regular turnover of the ammunition.

The revised edition of Equipment Regulations which will probably be issued this year, contains the following instructions at Section XII. of Part II., paragraph 186 :

"*For all practice the ammunition of oldest manufacture and that contained in packages which have been opened for inspection, will always first be expended, and will be replaced by the next supply from store.*"

(3.) There are insurmountable difficulties in the way of carrying out this excellent proposal, if date of making up the cartridges is to determine the group ; but it may be remarked that the amendment to the Magazine Regulations quoted above in (1) is considered to be the closest approximation to a solution of this difficulty which is really practicable. Many cases of small groups have been closely investigated, the worst that was brought to notice however proved that though the number of small groups appeared excessive, yet the actual difference in shooting of the different groups did not nearly approach the limits of error of the gun as shown by the 50 per cent. rectangle.



DIARY
OF
LIEUTENANT W. SWABEY, R.H.A., IN THE
PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 437, No. 9, Vol. XXII.).

PART III.

THE CAMPAIGN FROM MAY TO SEPTEMBER 1813.

Summary of the Peninsular Campaign from April to September 1813.

During the winter of 1812-13 unremitting attention was paid to restore the discipline and organization of the allied army, and considerable reinforcements were received.

The Cortes of Spain in the month of December, conferred on Lord Wellington the rank and authority of Generalissimo of the Spanish forces, and decreed that in the coming campaign he should have the active co-operation of 50,000 Spanish troops.

The French armies in Spain at the beginning of 1813 numbered 140,000 men. With the exception of 40,000 under Marshal Suchet in the eastern provinces of Catalonia and Valencia, they were spread over Castile, Leon, and the northern provinces under command of Joseph Bonaparte with Marshal Jourdan as Major-General; their object was to guard the line of the Douro.

Lord Wellington determined in the coming campaign to adopt the same strategy which in the previous year had liberated Andalusia, and by a flank movement through the province of Tras os Montes to turn the enemy's defences on the Douro. In conformity with this plan on May 15th, the left wing under Sir Thomas Graham marched through that province towards the Esla, while on the 22nd, the right wing under Wellington advanced through Salamanca on Zamora. On June 1st, after slight opposition, the wings were united at the latter place, and the first object of the campaign accomplished.

As a result of this, King Joseph concentrated his army on the Burgos road along which were good defensive positions and depôts of supplies. Lord Wellington continued his turning movements, manœuvred to his left and marching on Palencia forced the enemy on the 12th, to fall back on Burgos which he evacuated and blew up. Some fighting took place on the succeeding days, and on June 21st, in front

of the town of Vitoria, the French were defeated with great loss and driven in confusion towards the Pyrenees, leaving to their fate the fortresses of Pamplona and St. Sebastian.

On hearing of these events, the Emperor Napoleon despatched Marshal Soult to take command of the French army. He arrived early in July, and having reorganized the troops, commenced on the 25th, a series of operations with the object of dispossessing the allies of the passes of Maya and Roncesvalles in the Pyrenees and relieving Pamplona. At the outset Soult was successful and drove them back, but Wellington bringing up reinforcements and assuming the command, after very hard fighting between July 25th and August 1st, repulsed the French at all points, and the armies were established in nearly the same positions as before the advance of the enemy. The siege of St. Sebastian, which had been meanwhile converted into a blockade, was resumed, and on September 9th, the place was taken.

CHAPTER I.

"E" troop occupies cantonments at San Payo. Defective arrangement for the sick. Lord Wellington's strictures on the Retreat. Lieutenant Craster. The troop moves to Mello. Captain Macdonald goes home. Methods of procuring forage.

2nd December.—Marched into our cantonment at San Payo,¹ an inconvenient dirty village without forage, on the high road to Coimbra. The quarter falling to me by my own arrangement for the winter, is an empty room with a through draught from two windows with only shutters, certainly built in the dog-days. I was luckily never born to be nice. The inhabitants have a better room which I am entitled to claim, but I do not like these severities. I found it necessary, however, before I could get chairs and table to hold out a threat that I should find another house and send soldiers to be quartered on them. This arises from the vile, heartless disposition of the Portuguese.

3rd December.—No fire in my house and obliged to lounge away my time sadly. I and many others suffer from a remarkable lameness caused by the continual wet we have been exposed to, and our then putting our feet close to wood fires. There is no external appearance of soreness, but at night the most terrible pain in the ball of the foot totally takes away my rest, and in the day I cannot bare to put my foot to the ground.

4th December.—Found our situation for forage unfortunately very disadvantageous, it all being at a great distance and the roads to it very bad. I hope nevertheless our horses will cut a better figure than they did last year.

5th December.—Still so lame as to be unable to walk in pursuit of any amusement.

6th December.—The difference between the price of tea, sugar, and

¹ The villages of San Payo, Mello, etc. will be found situated in the vicinity of the river Mondego. See Map II.

all articles of import in this country and in Spain, is very great, and even since last year these articles have fallen; so certain and secure are the blessings of peace, and so advantageous the two years repose that this part of Portugal has now enjoyed.

7th December.—I am obliged once again to cry shame against the regulations for the transport of the sick. The unfortunate beings more fit for their death-beds than for being moved from one place to another, are daily passing through here from Celorico to Coimbra on cars without springs, every jolt of which is sufficient to fracture a limb; others dying are left neglected and unpitied by the road side, two hundred probably having only one hospital mate to dress their wounds or minister to their diseases.¹ I caught an infamous Portuguese bullock driver, the lowest coward perhaps in creation, beating with a stick an unfortunate wounded soldier who had spilt his blood for the villain at Burgos, because he was too helpless to dismount from the car to walk up a hill. I need not add that the revenge I took on the miscreant was ample and severe. I actually beat him till I could not stand over him.

The officers and escorts with these parties are too small and too inhuman for their duty. Pity and humanity are, I fear, neither allied to the modern hero nor his regulations. Lord Wellington, when the sick of his army are mentioned, hastily replies that he wishes never to hear but of effective men. Every day the effects of the retreat begin to shew themselves in the deaths of hundreds.

It is but just to Lord Wellington to quote here the following incident (F.A.W.) :—

“As I think you will be amused and interested by an authentic anecdote of Lord Wellington, I will tell it to you. It comes from his aide-de-camp, Major Gordon,² who brought over the account of the capture of Ciudad Rodrigo.

“Some little time ago, when a party of officers were dining with him, one of them happened to say that he had just returned from a place where a post of our soldiers were stationed, and that a considerable number of sick were without shelter, and exposed to the severity of the weather. When the party broke up Lord Wellington ordered his horse and set off with Gordon. They rode to the post in question, about 30 miles³ off, and arrived there about midnight. They found a great number of sick lying in the open air.

“Lord Wellington immediately knocked up the commanding officer, and asked why the men were left in such a condition. He said ‘there was no accommodation for them in the place.’

¹ “I have already seen enough of the unfortunate sick of this army to authorize the conviction that there is great room for improvement in the arrangements for the sick, and that more medical aid is much required. Humanity and policy equally dictate the necessity of care and tenderness towards sick men. I fear in many cases both have been wanting.” “Letters of Sir Augustus Frazer,” Coja, 21st January, 1813, p. 53.

² Lieut.-Colonel Sir A. Gordon, K.C.B., was killed at Waterloo.

³ Probably this distance is incorrectly given, they could hardly have ridden 60 miles during the night; possibly it should be 13 miles.—(F.A.W.).

“‘Be so good,’ said Lord Wellington, ‘as to show me this house.’

After he had walked over and inspected it, he told Gordon immediately to remove 150 of the sick into it. He then went to the next officer in rank, and so on, till he had removed the whole of the sick; and, then addressing the officers, he read them a severe lecture on the impropriety of their conduct, and told them that if they or any officer under his command should presume to consult their own convenience or luxury while a single sick man should remain unsheltered, he would make an example of them; and that, as to themselves, they might procure accommodation as they could somewhere else, for that the sick should remain where he had placed them.

“He and Gordon then mounted their horses, and returned to headquarters before day, and without anyone suspecting they had been absent. On the following evening, however, he told Gordon he suspected, from the sulky manner in which his orders had been received, that they were likely enough to be disobeyed; he therefore determined to pay those gentlemen another visit. Accordingly, they mounted their horses again, and arrived past midnight at the post, where they found the sick removed into the open air, and the officers comfortably reposing in their old quarters. However, he soon aroused them; for he ordered the sick to be instantly brought in, put the officers under arrest, marched them to head-quarters, where they were tried for disobedience of orders and cashiered.” Sir James Bland Burges, to his son Charles, 11th February, 1812. “Wellington,” by Lathom Browne, p. 38.

8th December.—An order¹ was published from Lord Wellington justly censuring the want of discipline lately shown by the army during the retreat, in which he says: “Never have I seen or even read of such relaxation in the discipline of an army as long as I can remember.” His Lordship’s remark is only too just. The cause originates in the officers who certainly have not exhibited, except in the moment of action, the necessary energy in the execution of their duties, and have neglected to enforce discipline amongst their men. This falling off has not, I am proud to say, reached the officers of artillery, who are doubtless more soldiers by profession than any other part of the army. With this conviction, how shall I add that the constitution of their corps prevents their exertions being rewarded!²

9th December.—Rode to Moimenta da Beira to call on the Earl of

¹ Memo. dated 28th November, 1812. Addressed to officers commanding divisions and brigades. Wellington Despatches, Vol. IX., p. 582. It was intended to be a confidential communication, but was published in the regimental order-books.—(F.A.W.).

² 2nd Captains, R.A., were at this time ineligible for brevet promotion. The officers of that rank in the Peninsula at the beginning of 1813, memorialized Lord Wellington on the subject, the memorial was referred home and favourably received. The gazette, after the battle of Vitoria, contained the first brevet promotion of the kind: 2nd Captain Jenkinson of “A” troop. See “Memoir of Field-Marshal Sir Hew Ross,” p. 36.

Dalhousie whom we found had heard by letter from Macdonald. I was glad to hear that he was doing well.

10th December.—Rode all day in the rain to find forage, I am sorry to say without success.

11th December.—It is ascertained that Clausel and Souham have set off for France with some force in consequence of disturbances.¹ There are only two regiments of cavalry at Salamanca. Soult, it is supposed, will winter at Madrid, probably despatching something southward. Meantime, Lord Wellington has gone off in person to the Cortes at Cadiz and declares his intention of entering Spain again at the end of March, on which subject my expectations are by no means hopeless. Unfortunate Salamanca was given up to four days plunder.²

12th December.—The rains set in with determined perseverance, consequently the exposure of our men in foraging becomes greater every day, and our hospitals begin to fill.

13th December.—To-day an unfortunate officer, a victim to the hardships of the campaign, arrived here on a bullock wain, having been all the night before in the rain. His servant came to us to beg a few rations. I was surprised to find I had humanity enough to go to see his master; he was in a house or hovel, not proof against the inclemencies of the weather, stretched on the remains of his bed that his servant had been able to carry. All his baggage animals were lost, and he, without more than a dollar in his pocket, was helpless and quite worn out with exposure to the inclemency of the weather. I am ashamed to say that the interest I should have felt for *any* fellow creature in such a state of distress was redoubled when I found him address me in the most gentlemanly manner. He seemed to me worthy of a better fate. I got him removed to a better house though there was none in the village capable of affording him the comfort his situation required. The Doctor saw him and we gave him tea and soup and took every step that suggested itself to assist him. It is not usual to find, particularly in soldiers of the line, that dutiful attention to their masters which was evident in this poor fellow's servant.³ I felt for him the greatest regard possible on account of his kindness. He told us his master had left the army at Burgos, at the commencement of the siege, was a little better when he was hurried out of the hospital

¹ This was due probably to news received from Paris of the conspiracy of General Malet, which so nearly succeeded in overturning the Empire. The 2nd Vol. of the lately published memoirs of the Chancellor Pasquier adds considerably to our previous knowledge of this strange enterprise. Napoleon heard of it December 5th just before he quitted the army at Smolensk during the retreat from Moscow, and it most likely determined him to take that step.—(F.A.W.).

² There does not appear to have been any recognized plundering, but a very bitter feeling existed between the Spanish civil and military authorities and the British army whilst the latter occupied Salamanca during the retreat from Burgos and Madrid, many acts of violence were committed on both sides. See Napier, Vol. V., p. 320, *et seq.*

³ Apropos of what is here stated. Captain McCarthy, who was severely wounded at the escalade of the Castle of Badajos, and not removed till late in the day following the assault, says in his "Recollections of Badajos," "I had strictly ordered my servant to seek for me among the fallen, if I did not return from the attack in the morning; he had, however, remained in charge of my baggage he said; but I said that he had remained, in preference, in charge of a large pot of soup and a bag of wine, for regaling himself and fellow servant. I dismissed him as soon as another could be obtained."

at Salamanca, from whence he had got to Celorico, and had imprudently set out to get to Lisbon in conformity to the orders he received. I should like to see who would prescribe my death and persuade me to move unprovided with one single necessary for such a journey! This is the way we weaken our army and reward our sick and wounded.

Napier's remarks concerning the French and English hospitals in the Peninsula are worthy of attention here.—(F.A.W.).

"It is a common, yet erroneous notion, that the English system of hospitals in the Peninsula was admirable, and that the French hospitals were neglected. Strenuous and increasing exertions were made by Lord Wellington and the chiefs of the medical staff to form good hospital establishments, but the want of money, and still more the want of previous institutions, foiled their utmost efforts. Now there was no point of warfare which more engaged Napoleon's attention than the care of his sick and wounded; and being monarch as well as general, he furnished his hospitals with all things requisite, even with luxuries.

"Under his fostering care also, Baron Larrey, justly celebrated were it for this alone, organized the establishment called the hospital '*Ambulance*,' that is to say, waggons of a peculiar construction, well horsed, served by men trained and incorporated as soldiers, and subject to strict discipline. Rewarded for their courage and devotion like other soldiers, they were always at hand, and whether in action or on a march, ready to pick up, to salve, and to carry off wounded men; the astonishing rapidity with which the fallen French soldiers disappeared from a field of battle attested the excellence of the institution.

"But in the British army, the carrying away of the wounded depended partly upon the casual assistance of a weak waggon train, very badly disciplined, furnishing only three waggons to a division, and not originally appropriated to that service; partly upon the spare commissariat animals, but principally upon the resources of the country, whether of bullock carts, mules, or donkeys, and hence the most doleful scenes after a battle, or when a hospital was to be evacuated." Napier, Vol. V., p. 248-9.

14th December.—Our unfortunate patient, who now engrossed every spare moment, expressed his anxiety at not having heard for a long time from his friends. At his request we wrote to his regiment, the 4th, to enquire for his letters.

15th December.—Incessant rain continuing, our men, daily exposed to its effects, crowd the hospital.

16th December.—Rode in the rain in search of forage which is already becoming scarce, and only to be found at a distance. I find the natives are, with their usual apathy and ignorance, refusing any assistance to

the troops and we are obliged to seize what we want. How much less oppressive it would be if a regularly administered government fixed on an equal contribution from the individuals in each jurisdiction in the vicinity of our quarters and enforced its collection. Instead of which the only answer from the justices is, that they have nothing in the country, which we all know to be false, and so are obliged to rob the first we meet.

17th December.—Our unfortunate friend, poor Craster,¹ became so ill that he would not or could not speak, and his faithful servant fell ill with the same complaint, that is, typhus produced by fatigue.

18th December.—Incessant rain, I was nevertheless obliged to scour the country for forage.

N.B.—We hired a cook who is wife to an artillery soldier, whom we likewise detained. Dinner very elaborate, sauces, ragoûts, hashes, roast, boiled, and baked, not to be sneezed at. I do not think I am a glutton, but there is a pleasure in entertaining one's friends *comme il faut*.

19th December.—My house being too cold to sit indoors one moment I was obliged to go out though it rained as usual. The unfortunate sick daily passing, notwithstanding the known and expected inclemency of the season, too clearly prove that humanity has no place in the bosom of those who are daily accustomed to the cruelties of war. As we might expect the unfortunate victims of this heartless system are left dead, and even unburied on the road side.²

20th December.—Misery ever before my eyes renders this the most uncomfortable abode I ever inhabited. I can look without compunction on the field of battle, but this sort of murder is too inhuman even to bear thinking of.

21st December.—Received some English newspapers. Among other articles, Lord Somers in supporting the motion of thanks to the Marquis of Wellington,³ prompted by civilities rendered to his son,⁴ bears testimony to the very reverse of that exalted personage's character. He says, that, "Lord Wellington is in the constant habit of having about

¹ Lieutenant W. T. Craster, 4th Regiment, 1st Commission, 27th June, 1811.

² "As the war enlarged, the increasing number of the sick and wounded pressed on the limited number of medical officers, and Wellington complained, that when he demanded more, the military medical board in London neglected his demands, and thwarted his arrangements. Shoals of hospital mates and students were indeed sent out, and they arrived for the most part ignorant alike of war, and their own profession; while a heterogeneous mass of purveyors and their subordinates, acting without any military organization or effectual superintendence, continually bade defiance to the exertions of those medical officers, and they were many, whose experience, zeal, and talents would with a good institution to work upon, have rendered this branch of the service most distinguished." Napier, Vol. V., pp. 249-50.

³ Vote of thanks moved by Lord Bathurst in the House of Lords on 3rd December, 1812 "That the thanks of this House be presented to General, the Marquis of Wellington, for his many and great services; more particularly for the great and decisive victory of the 22nd July last, whereby, the siege of Cadiz was raised, and the Andalusians rescued from the hands of the enemy." *Courier* newspaper, 4th December, 1812.

⁴ Major, the Honorable E. C. S. Cocks, 79th Regiment, killed in a sortie from the Castle of Burgos, 8th October, 1812. He was an excellent officer, and began his service in the 16th Light Dragoons. In the "Diary of a Cavalry Officer in the Peninsular and Waterloo Campaigns," the writer, Tomkinson, who served in Cocks' troop, gives many particulars of his soldierly qualities and kindness of heart.

him young officers whom he conciliates by his attentions and takes pains to instruct. One of the remarkable parts of his character is the kindness and humanity he possesses." What a humbug! I should like to place his Lordship one half-hour at my window. I may be wrong in imputing the miseries to be seen from it to Lord Wellington; he has not witnessed them as they necessarily take place out of his sight, the head-quarters of course being in advance of the hospitals. But for the medical department, odious and detestable may their memory and their fate become, in proportion to the want of feeling they possess! On these wretches I have even seen the public prints prostitute the supposed medium of truth, and this not from any party feeling but from the secret inspiration of that diabolical part of society called the medical staff of the army; for from what other source can such frauds on the public mind have risen?

As to Lord Wellington's condescension and kindness to officers, it requires only to ask to be satisfied as to its existence. On this point I do not blame him. I think those qualities would lead to endless interruption and impertinent intrusion. I therefore think he judges wisely in not exhibiting them. People in general affect to be dissatisfied with the measure of his praise; his despatches however have no right to be compared to those of our officers commanding what we term "an expedition," who to make their own fame deal out encomiums to those under them.

22nd December.—Major Downman and Harding¹ arrived, and dined and slept as our guests. I was very happy to meet the latter.

23rd December.—As usual raining all day. Our visitors remained, but we had no amusement to offer them. The Major, who is not free from the imputation of being an epicure, did not fail to praise our cook.

About this time the Horse Guards and Horse Guards Blue arrived at Thomar, six troops each.

24th December.—The rain ceasing for a time, I was over-persuaded to join the Major and Harding and set out with them for Taboa. Owing to the guide's and their obstinacy we made our journey which ought to have been 7 leagues into 9, and the Major being ill we went at a walk. We did not arrive at their abode till 8 o'clock at night, after travelling 2 hours in the dark over such a rocky road that I was in momentary expectation of breaking my neck. My horse fell twice, but "up again" said the spurs.

25th December.—Having ridden thus far to spend Christmas day, I could not enjoy myself because I thought only of how it had been passed in the preceding years of my life; it was before always a time of pleasure.

26th December.—Ramsay, with Bull's troop, lying in the road home to San Payo, they prevailed on me to spend a day with them. It commenced by shooting on our way. In this operation I lost the party and

¹ Lieutenant R. Harding (Kane's List No. 1322) was appointed adjutant R.H.A. in October 1812, and held that appointment until August 1813, when he rejoined and remained with "E" troop until the end of the war. He served with it in the campaign of 1815, in the retreat from Quatre Bras and at Waterloo. 2nd Captain Harding retired in 1825, and died in 1849.

had to pass the day by myself, but arrived notwithstanding at the Medico's in time for dinner, and passed a stupid evening. It appears to me rather an odd arrangement to send cavalry to be quartered in this district, as it affords nothing but Indian straw, whilst hay and good forage are to be found elsewhere.

27th December.—Refusing all inducements to stay, I returned to San Payo where I found poor Craster nearly dead and the servant, though still sensible, in a totally hopeless condition.

30th December.—Poor Craster died last night; on opening his papers we found letters of a most affectionate strain from a mother and sister complaining of not having heard from him; we were afraid we should be obliged to write direct to them till at last we found one from another hand which relieved us from so painful a task. I penned the letter for us all which Dyneley sent off.

31st December.—I read the service over the unfortunate Craster, it is of itself an awful ceremony, but when I reflected that the poor fellow had no friend, no relation to pay him the least tribute of affection, and when I read over and over again his sister's letters, I could hardly conceive a more affecting case. A soldier that dies in battle falls in a noble pursuit, and his loss, as being always looked forward to, is disarmed of half its severity, but when a friend is lost who might have been saved but for many melancholy circumstances, there is no bound to one's grief and indignation.

1st January, 1813.—I did not so soon expect to have again to perform the duty that I went through yesterday; two of our men, however, have died and I have been obliged to repeat it. Three others have been buried since our coming to this accursed place; what between the weather, and the contagion consequent on the miserable sick taking shelter in our houses, such calamities were to be expected.

2nd January.—We received our long expected permission to change our quarters to Mello.

3rd January.—Marched for Mello. The principal object in our moving is to get a commodious hospital, and leave a dreadful contagion, notwithstanding which our place is to be filled by other troops. We had so few men we could hardly drive the carriages. We moved the sick on bullock wains.

4th January.—I found myself in a comfortable clean quarter, and the troop well put up.

5th January.—Major Frazer,¹ passed through on his way to head-

¹ Major Augustus S. Frazer (Kane's List, No. 765), who had previously served in command of "G" troop and the R.A. of the expedition against Buenos Ayres in 1807; joined the Peninsular army in November 1812, having temporarily exchanged with Major Bull invalided. In April 1813, Frazer was appointed to command the H.A. vice Downman. He was present at the affairs of Salamanca and Osma, at the battle of Vitoria (brevet Lieut.-Colonel), siege of St. Sebastian, passage of the Bidassoa, at Nive, Nivelle, investment of Bayonne (wounded), and battle of Toulouse. He was made a K.C.B., and received the gold cross with one clasp at the end of the war. In the Waterloo campaign Sir Augustus again commanded the H.A. He was afterwards at the head of the Royal Laboratory. He died in 1835. His interesting letters from the Peninsula and the Netherlands were published in 1839. "Although a reserved man in public, and fond of solitude, he was almost diffuse in his correspondence." Duncan's R.A. History. Captain Mercer, who served under him as a subaltern says, "He was a most active and zealous officer, and a very precise and particular little man."

quarters, he is improved so much as a companionable creature that he is really exceedingly pleasant.

6th January.—Our forage is somewhat nearer than at San Payo, but still scarce, and we have 50 men in hospital; about 7 horses to one man, the only possibility of exercising them is to turn them out. Fortunately the weather though cold has ceased to be wet.

7th January.—Rode with the commissary to find bullock wains; these are so difficult to obtain that we take them by force, and their owners are so expert at running away that we can scarcely ever retain them.

8th January.—Ascended the Sierra de Estrella in pursuit of forage by a road scarcely passable, I found a considerable quantity carried there by the inhabitants to elude our search.

9th January.—Foraged from Figuerio, but with little success, some cars were sent to the mountains, but the people took them from the escort. I to be sure was not in a passion when they came without them!

10th January.—The first snow fell on the mountains. Although we are posted at their foot we did not feel it the least; which proves that it certainly falls on the mountains when it is not seen anywhere else.

11th January.—Foraged from Linhares, a town on the edge of the mountains. I found there that the commander-in-chief's order for laying up a store of forage for the use of the troops had been attended to, but this was a rare instance and the quantity was so small as to be of little use.

12th January.—Macdonald arrived on his way to England, Frazer and Jenkinson¹ with him. He is so rapidly recovered that his wounds are nearly closed but it is feared he never will recover the use of his right leg. He goes poor fellow to England, not to meet the satisfaction of seeing his family surrounded by happiness, but to encounter great domestic sorrow.

13th January.—Macdonald being in excellent spirits we passed the day very pleasantly. Jenkinson and Frazer contributed their share to our enjoyment.

14th January.—Our friends still with us, but rain prevented any out of door amusements. Towards evening Frazer, to whom such scenes are new, lugged me up the side of the mountain till I was ready to faint. When there, he was surprised to find I had no enthusiasm in my praises of pine trees, stony ravines and fir-clad precipices; these are grown so familiar that they cease to be objects of surprise.

15th January.—Macdonald, after being very generous in the distribution of his effects, left us with his party in a spring waggon. I could not help contrasting his situation, surrounded by conveniences, with poor Craster's. These are certainly more within the reach of an artillery officer than any other.

¹ Captain George Jenkinson (Kane's List, No. 1032) served with "A" troop throughout the Peninsular war.

16th January.—We received Russian news,¹ our exploits so diminutive in comparison, shrink quite out of recollection, and the battle of Salamanca is scarcely mentioned without a blush.

17th January.—I went to Linhares in pursuit of bullocks. Having found a pair at plough, I left a man as sentry whilst I pursued some others that were in sight. During my absence the peasants got about him with guns and all sorts of weapons. He behaved very well and intimidated them so much by repeated charges that he kept them all at bay till I came back, when he pointed out one fellow who had threatened him very much and was then running away. I immediately rode after him, but he took such a line of country that, after jumping two or three walls, my horse could go no further, so I dismounted and pursued the rascal on foot. I got so close to him that he was frightened out of his wits and jumped down the most dreadful precipices. I followed till at last he took such a tremendous one that he lay groaning at the bottom. I was afraid he was killed, and notwithstanding the crowd went round to his assistance; they had however carried him off and told me he was not much hurt. I then proceeded and made my complaint to the magistrate and threatened him till he sent off three prisoners to jail. These fellows, who will take any advantage of a *single* Englishman, run like cowards the moment he receives any assistance.

18th January.—Being reduced to our wits' end for forage, we searched the very chimneys, cupboards, ovens, and beds of two neighbouring towns, and by that means found a great quantity.

19th January.—We rummaged Mello in the same way we had served the other two towns. In the house of a fat rich priest we found forage admirably concealed, but we were too cunning for the parson. A large cellar with nothing apparently but wine in the barrels contained pipes of straw; and cupboards with the doors pasted up with paper, and false roofs gave us a plentiful harvest; last year we did not know how to play these tricks.

20th January.—We continued our search; the same priest however certainly beat us, for I had information that he had hay in his house and with the utmost diligence could not find it.

21st January.—The weather is now a settled frost with fine wholesome sunshine every day.

22nd January.—Lord Wellington being hourly expected at Lisbon from Cadiz great preparations are being made to receive him. He is the undoubted deliverer of Portugal, but I believe, except in the capital, there are few who are not too ignorant to be grateful; this stupid, idle, dirty, cowardly race is daily becoming more unpleasant.

23rd January.—Rode to Videmonte in the mountains for forage. There I had the mortification to find it bespoken by the infantry. The towns in the mountains are situated in an infinitely finer country than those at their feet, the pasturage and soil are beautiful, and there is not a stone or a rock to interrupt the fertility.

¹ Probably account of Battle of Borodino, 7th September 1812, when Napoleon defeated Kutusoff,

24th January.—Occupied on the same business as yesterday. We are now obliged to turn the water off the water meadows and send our horses in to feed ; these meadows produce repeated crops by the simple process of turning the brooks over them. To effect this of course the meadow must be on a slope, and a stream of water adjacent to the top. A ditch with small channels at intervals is then dug along the upper part of the meadow, into which the water being turned it flows continually over the soil, which produces repeated crops, and can be drained at pleasure.

(To be continued).

A LETTER

ON

TERRESTRIAL REFRACTION AND MIRAGE.

BY

LIEUTENANT F. BROWN, I.O.M., R.A.

THE lecture delivered by Major MacMahon, R.A., F.R.S. on "Terrestrial Refraction and Mirage" I have read with much pleasure, more particularly perhaps, as I happened to be serving in Rangoon during the same period as Major Barlow, R.A. and, therefore, well remember the interest this question of refraction and mirage occasioned in that command.

Since the object of the lecture was to investigate whether any correction in elevation should be given to guns to counteract the influences of refraction, and if so, how much, it has occurred to me that it might not be out of place for me to submit to the Institution a correction for quadrant elevation which appeared to me some few months ago as desirable. The correction is definite, though small, and possesses the merit of not fluctuating with the varying atmospheric conditions.

It is as follows :—

The formula at present in use for calculating the quadrant elevation of guns in elevated batteries is—

$$\theta = \phi - \frac{h}{R} 1146 \dots\dots\dots (1)$$

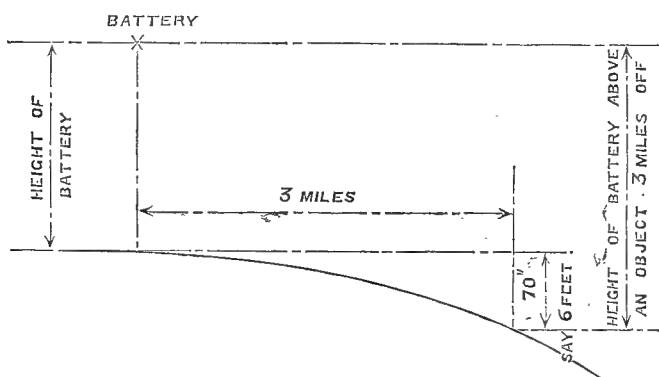
$$\left\{ \begin{array}{l} \text{where } \theta = \text{quadrant elevation in minutes.} \\ \text{,, } \phi = \text{angle of elevation in minutes as per range table.} \\ \text{,, } h = \text{height of battery in feet.} \\ \text{,, } R = \text{range in yards.} \end{array} \right\}$$

Now this formula does not take into account the curvature of the earth, and moreover, the mean water level at the battery itself appears to be just the place where it is of the smallest importance. Of course this height must be known before the corrected height can be obtained, but it is not, in my opinion, the proper altitude to use in the calculation.

That curvature should be taken into account must be admitted, because the height of the gun above the object aimed at will vary with the range, or distance of the object. With a range of 5000 yards, or say three miles, the dip due to curvature amounts to about 70 inches, and this amount must obviously be added to the height of the gun

above the mean water level at battery, to give its height above an object three miles off; this is seen from Fig. 1.

FIG. 1.



In the new calculation the dip due to the extreme fighting range of the gun could be allowed for, and the range would, of course, vary with the gun used, the limits being probably between one and three miles; the amount to be added to the height of the battery would then be approximately as follows:—

Extreme fighting range of gun in miles.	Feet to be added to height of battery.
1.....	·65
2.....	2·60
3.....	5·85
4.....	10·40
5.....	16·25

The formula would then be—

$$\theta = \phi - \left(\frac{h + A}{R} \right) 1146 \dots \dots \dots (2)$$

Where A = additional height to be added to the height of the battery, and corresponding to the dip at the extreme fighting range of gun.

This formula, although probably better than the one at present in use, is not absolutely correct, because " A " is taken as a constant, whereas it is really a variable varying with the range " R ."

As the varying dip for any range can easily be calculated and embodied in a general formula, I would therefore suggest the following:—No. 3 as the most satisfactory of the three, because the variation of dip due to any range, " R " is taken into account.

$$\theta = \phi - \left(\frac{h}{R} + \frac{·65 R}{(1760)^2} \right) 1146 \dots \dots \dots (3)$$

θ , ϕ and h are in the same terms as equation... (1)

this is equal to—

$$\theta = \phi - \left(\frac{h}{R} + ·0000002098 R \right) 1146 \dots \dots$$

Working out the examples given on p. 181, Part III., Garrison Artillery, according to this formula, the amount to be deducted is 23·4 minutes, or ·48 minutes more than given by the old formula (the book says 22 minutes deduction, this should obviously be 22·92 minutes).

Take another range, say 4000 yards—

the old formula gives 11·46 minutes deduction

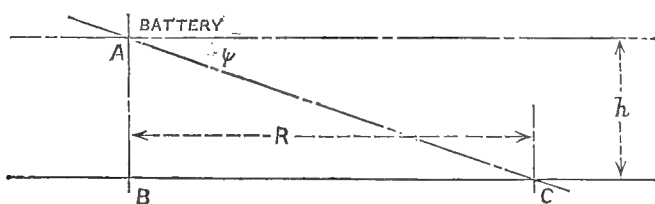
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a difference of ·97 minutes.

This difference, although small, is a correction, and as one formula is worked as easily as another, the modification is probably worth consideration.

The D.R.F. is corrected for this curvature, and therefore it would appear that the quadrant elevation of the gun should also be subjected to a similar correction, that it has been ignored is shown by the manner the formula (1) is deduced:—

FIG. 2.



ψ = angle of depression in minutes.

h = height of battery in feet.

R = range in yards.

then $\frac{h}{3} : 2\pi R :: \psi : 360,60$ (approximately).

$$\therefore \psi = \frac{360 \times 60 \times h}{2\pi R \cdot 3} = \frac{3600}{\pi} \frac{h}{R}$$

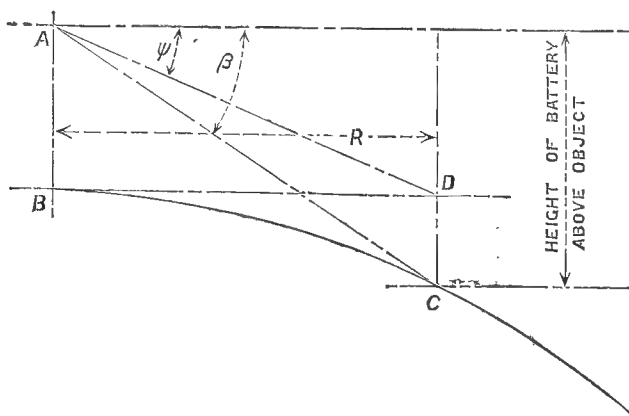
$$\frac{3600}{\pi} = 1146 \therefore \psi = \frac{h}{R} 1146$$

{ = amount to be deducted in minutes from the range table elevation to }
 { give quadrant elevation, as per formula—(1). }

This proves, conclusively, that this formula does not consider curvature.

In Fig. 3 the effect of curvature is shown; instead, therefore, of ψ

FIG. 3.



being subtracted from the range table elevation, the larger angle β

should be deducted, this being the correction considered in formula (3).

It is perhaps worthy of note that, with a range of three miles, the dip is approximately 5·85 feet, and this is equal to about 1' 17", or say, within a second or two of the maximum refraction given by Major MacMahon. The total amount of depression at this range—for very low batteries—would therefore appear to be—

1' 18" for refraction

1' 17" for curvature

2' 35" = additional depression required on the gun.

for a range of three miles, if the present method of calculating quadrant elevation is continued.

It will be probably considered that a dip of ·65 feet for one mile is too great, I rather think it is, but in the absence of anything reliable—no two authorities absolutely agreeing—I have considered ·65 feet as sufficiently near for the purpose.

THE ARTILLERY IN CHITRAL.

BY

CAPTAIN G. F. HERBERT, R.A.

THE following is an account of the part played by the artillery in the Chitral Relief Expedition. The batteries which were actually engaged during the campaign were :—

No. 3 Mountain Battery	..	...	...	...	Major J. D. Cunningham.
„ 8	„	„	„	„	„ J. C. Shirres.
„ 2 (Derajat) Mountain Battery	...	...	...	...	Captain J. L. Parker.

The 15th Field Battery also formed part of the expedition. Unfortunately it was not sent up from Campellpore till some time after the rest of the troops had started, consequently it was not in time to take part in the fight at the Malakand Pass, and beyond this point it did not go. I believe the battery was delayed while experiments were being made with a view of the guns, &c. being carried over the passes by elephants, but it seems a great pity that it was not sent up at once to march as far into the country as it could.¹ It could certainly have been brought into action at the Malakand and would probably have been most useful as, at the first two positions occupied, the range was too long for the 2.5" gun to have very much effect.

It is much to be regretted that the opportunity was missed as the 12-pr. B.L. has never, I believe, been fired against a real enemy and much valuable information might have been gained even if it had taken part in one action only. Moreover it is now more than ten years since our horse or field artillery has fired a round on service while every single mountain battery, British and Native, has been through at least one campaign during that time.

In the Chitral campaign the mountain batteries were again to the fore. Each of the three was engaged in more than one action and on every occasion played a very prominent part.

I do not propose to write a regular narrative of the campaign, but only to record as much as is necessary to describe the movements of the batteries.

I was fortunate enough to obtain leave to accompany the expedition as a newspaper correspondent. Lieutenant Pack-Beresford, R.H.A., went up in the same capacity. We travelled together and had a most interesting trip, returning to India from Gilgit *via* Chilas. We left

¹ This was done in the case of cavalry with excellent result, as, contrary to expectation, they found country where they could act and were of the greatest possible service in at least two of the actions. Beyond the Janbatai Pass the country was quite impracticable and they were not sent on.

Hoti Mardan on 1st April and reached Murree on 14th June, during which time we marched about 800 miles.

At the time mobilization was ordered the three mountain batteries were stationed :—

No. 3 and 8 at Rawal Pindi.

No. 2 (Derajat) at Kohat.

Their respective strengths were :—

				Officers,		N.C.O.'s and men.	
No. 3	...	...	...	5	...	...	109
„ 8	...	...	...	5	...	...	110
				British Officers.		Native Officers.	
						Fighting men.	
						Followers.	
No. 2 (Derajat)	...	3	...	...	2	...	...
						177	...
							66

[A section of this battery was on command in the Kurram Valley and did not take part in the Chitral Expedition].

These three batteries were under command of Lieut.-Col. W. Aitken with Captain G. C. Dowell as adjutant.

The Colonel on the Staff, R.A., was Colonel W. W. Murdoch, Staff-Captain, Captain M. F. Fegen.

The batteries proceeded to Hoti Mardan by march route, seven marches from Rawal Pindi, ten from Kohat.

At Hoti Mardan they joined the brigades to which they were originally attached, viz. :—

No. 3 to 1st Brigade	...	...	...	...	Brigadier-General Kinloch.
„ 8 „ 2nd „	...	...	...	...	„ „ Waterfield.
„ 2 (Derajat) to 3rd Brigade	...	...	...	...	„ „ Gatacre.

The batteries having come by march route instead of by rail, as was the case with the infantry, were probably the fittest troops on the ground at the time of concentration.

1st April. The advance from Hoti Mardan commenced on 1st April when the 2nd and 3rd Brigades marched to Jalala (14 miles) while the 1st went to Lundkhawar to make a feint against the Shahkot Pass.

2nd April. On 2nd April the 2nd Brigade marched to Dirgai at the north of the gorge leading to the Malakand Pass while the other brigades encamped a few miles away, the 1st still heading for the Shahkot Pass.

3rd April. On 3rd April the 2nd Brigade moved out at 8 a.m. to attack the Malakand, both batteries from the other brigades having come up to join it before it marched.

General Low's plans had been kept profoundly secret. Until the last moment the whole force thought that an attack was also to be made on the Shahkot Pass by the 1st Brigade while the 3rd Brigade was to remain in rear, ready to support either of the others if necessary.

In reality the movement of the 1st Brigade were merely a feint and they eventually came up and reinforced the 2nd at the Malakand.

I suppose it was owing to the closeness of this secrecy that the C.R.A. was left at the base, in ignorance that his three batteries were to be brigaded together on 3rd April.

In his absence the command fell to Major Cunningham whose place as Battery Commander was taken by Captain Grier.

The three batteries advanced in line of battery columns along the east of the valley encountering a good deal of rough broken ground en route, but one must see a mountain battery on the war-path to know what marching really is, and it was a great sight to see how they swung along taking everything as it came.

The first shot was fired at 8.55 a.m. by the enemy at the Guides' cavalry who were reconnoitring towards the pass, but it was not till nearly 9.30 that No. 3 came into action on a ridge running across the valley with a narrow crest, very rocky and broken. The range from here to the enemy's sungurs was about 4000 yards, rather excessive for the 2.5" gun, and I do not think much damage was done. No. 8 came into action beside No. 3 a few minutes later and took up the fire. No. 2 (Derajat) also unlimbered but did not fire.

I believe Major Cunningham did not select this very long range position but was ordered to take it up. Presumably the General did not wish to send troops too far forward up the valley until the flank attack being carried out by the Guides and 4th Sikhs on the high hills to the left was more developed.

At 10 a.m. the guns limbered up and advanced to a range of about 3000 yards, still too long for very great effect, though the practice was good and many shell appeared to tell.

¹ "This position they maintained for about an hour, shelling the village of Malakand (at the head of the pass), the adjacent sungurs and any groups of the enemy that came into sight. The effect was decidedly good as any attempt on their part to form a large gathering was at once frustrated and subsequent observation showed that their loss from shrapnel fire was very great, a good deal, no doubt, having been inflicted from this position. At 11.15 the artillery ceased firing, limbered up and advanced along the foot of the hills on the right of the valley, the main body of infantry also advancing along the centre, the whole moving up to within 1400 yards of the village where the batteries came into action on a prominent spur. The batteries quickly got the range, and from this time to the final assault of the position, they fired with deadly effect." The top of the crest on which the batteries came into action was so narrow that one gun of No. 3 had to be kept in its place when fired by the gunners holding on to drag-ropes attached to the axles to prevent it recoiling down hill.

Major Cunningham has kindly supplied me with the following notes :

"At the third position I kept the fire of all three batteries on the lines of sungurs that successively opposed the advance of our infantry, firing with time shrapnel close over the heads of our infantry. As British infantry use cordite, they made no smoke, and their khaki clothes being the same colour as the hillside, the men were most difficult to see. Consequently one had to keep a very sharp look-out indeed so that one did not continue fire too long after they had masked targets unnoticed.

¹ I quote from the *Morning Post* (Allahabad) for which paper I acted as correspondent.

I controlled the fire from a hill peak, having one battery on my right and two on my left and used my voice for orders, first calling attention by the whistle. I found it very advantageous to have men from each battery on the flanks nearest me, watching me for orders and calling the attention of Battery Commanders when I wanted them to hear. At no time were infantry firing nearer than 600 yards; had they been nearer the task of controlling the fire of three batteries in the way I did would have been most difficult, if not impossible. A Maxim gun that occasionally fired near us completely drowned my voice. The three batteries occupied a front of 300 to 350 yards. When the enemy was driven out of all sungurs on the hillside and our infantry were near the top, the fire of all three batteries was concentrated on the village. The shells burst most regularly.

At the second position No. 3 Mountain Battery, R.A. fired at a large sungur on the top of the hill on the left about 2000 feet above the battery. Range 2525 yards. The third shell struck the top of the wall and the three following did likewise. Trails had to be sunk in the ground to get the necessary elevation."

I accompanied the infantry at the assault of the hill and I particularly noticed the absolute confidence that they placed in the accuracy of artillery fire and observation. The possibility of danger from that quarter never seemed to strike anyone though many of the shells sounded unpleasantly close, and I admit that I, personally, had occasional reminiscences of incidents while on range duty such as bad fuzes. Certainly a little knowledge is a dangerous thing.

(1) "Had it not been for the heavy shelling which the position underwent from the three batteries of artillery, the final assault would have been infinitely more troublesome. The effect of the shrapnel fire was very deadly and far-reaching. Not only in the sungurs, but in the village and for some distance beyond it were traces of the terrible way in which it had done its work."

The expenditure of ammunition was :—

				Ring.				Shrapnel.
No. 3	...	...	...	48	...	...	...	148
" 8	...	...	...	35	...	...	...	69
" 2 (Derajat)	...	...	...	30	...	...	...	114

After the pass had been forced, the three batteries ascended the hill and bivouacked on the top with the 1st Brigade. The ascent was terribly difficult and the road was much blocked. The Derajat battery took three hours to reach the top. Hardly any of the transport got up that night and comparatively little the next day, so those bivouacking on the summit of the hill had a very rough experience, suffering as they did from cold, hunger and fatigue.

4th April

On 4th April No. 3 Mountain Battery accompanied the 1st Brigade which moved on to Khar in the Swat valley—about four miles. They were attacked on the way and came in for some sharp fighting. Indeed it is considered that the enemy were in greater force and sustained heavier losses than on the previous day. On this occasion they were

¹ *Morning Post.*

acting more on the offensive and were consequently more exposed—a fact of which our troops did not fail to take advantage. The Guides' cavalry made a successful charge and, in spite of very heavy going and tired horses, inflicted considerable damage while the battery made some beautiful practice at groups of the enemy and accounted for a very large proportion of their total loss.

I again quote Major Cunningham's notes: "On 4th of April, at one time, No. 3 Mountain Battery, R.A. came into action against a large sungur on the hilltop that was full of men and flags, and giving a lot of trouble to our infantry. A man was standing on the wall waving a green flag. The mekometer gave range 1300 yards. Ring shell was used. First round, 1300 yards—short. Second, 1400 yards—over. Third, 1350 yards—shell burst on top of the wall just under the man with the flag, who went up in the air and came down flat. The remaining three rounds burst in the sungur, silencing it for the rest of the day. I heard afterwards from the political officer that the man with the green flag was a leading tribesman. On 4th April I used time shrapnel at ranges up to 1000 yards, without previously getting the range, where rapidity in catching the enemy by surprise was necessary, with excellent results. The enemy's losses that day were estimated at 500, of which the larger portion must have been due to guns."

With regard to the incident of the man with the green flag, the correspondent of the *Englishman* (Calcutta) writes: "There is one incident which took place when Major Cunningham's battery first came into action, which is worth recording. The enemy had planted many coloured standards over their defences, and before the guns had found the range correctly, and when the shells were not getting home, one of the enemy, evidently a deserted sepoy, stood on the centre sungur and signalled the misses with military precision.—'Miss, low to the right, high to the left!' in accordance with the inaccuracy of the firing. Though our fighting line was extended with fixed bayonets in anticipation of a rush, and the tension was great, yet the affair was too palpable and absurd, and a laugh passed right down the line. But No. 3, R.A. made up for this show of sarcasm when they found the range." The same writer says, "Major Cunningham gave the sungurs a last benefit. The shooting of the battery was simply perfect, and the last fire of the day must have had a demoralizing effect. Shell after shell burst upon the defences, and, in one instance, four shells in succession fell into the centre sungur almost at the same spot."

That night the 1st Brigade bivouacked in the open in momentary expectation of an attack, but none was made and the night passed off quietly.

On 5th April the 2nd Brigade marched to Khar, bringing with it No. 8 and the Derajat batteries. No fighting took place on that day, nor on the 6th, though large bodies of the enemy were seen in the neighbourhood with flags, tomtoms, and other warlike stores, and a few stray shots were fired at our convoys and reconnoitring parties.

On 6th April the 2nd Brigade, with No. 8 and No. 2 (Derajat)

5th April.

6th April.

batteries, moved on about eight miles to Aladand.

7th April. On 7th a working party of sappers and miners, with a small infantry escort, went out at daybreak to commence bridging the Swat river, from which the camp was about a mile distant. As they approached, the river parties of the enemy appeared on the hills opposite and began firing at them. It was soon evident that the enemy was in force, and General Waterfield ordered out all the troops at his disposal. The ground near the river was very bad, consisting of deep, boggy rice fields intersected by watercourses, many of which were quite impassable for horses and mules. At 7.30 a.m. No. 8 Mountain Battery came into action, near the place where the bridge was to be built, against parties of the enemy firing from sungurs and hilltops, at ranges of 1300 to 1600 yards. The Derajat battery was proceeding to join No. 8, when it was ordered to take up a position higher up stream to cover the crossing of the cavalry, but, owing to the villainous nature of the ground, the movement took some time, and the action terminated soon after they had commenced firing.

By 11.30 a.m. the cavalry had forded the river and put the enemy to rout, so the action was then at an end as far as the other arms were concerned.

		Ring.		Shrapnel.	
Ammunition expended	No. 8 Mountain Battery	...	...	8	81
	No. 2 (Derajat) Mountain Battery	...	...	8	1

On 4th April the Derajat battery had handed over to No. 3 Mountain Battery 48 ring and 148 shrapnel shell, so they had now only 56 ring and 97 shrapnel remaining.

8th April. On 8th April No. 8 and No. 2 (Derajat) batteries forded the Swat river with the 2nd Brigade, the latter going forward with the advanced guard to the Katgola Pass, about nine miles, while No. 8 remained at Chakdarra, close to the river, where the main body of the brigade halted till the 10th. Captain F. W. Stanton was sent back to the field park at Dirgai for a fresh stock of ammunition. Starting on the 8th and moving by double marches, he caught up his own battery (No. 8) at Chakdarra on the 10th and the Derajat battery at Sado on the 11th.

9th to 12th April. On 10th April Lieutenant Hare's section of the Derajat battery, while marching by an unreconnoitred road, lost a mule and gun carriage, the mule falling with his load into the Panjkora river and being drowned. The rest of the day was spent in fruitless endeavours to recover the load. It was a very serious matter as there was no spare carriage with the force, and this meant that the battery was reduced to three guns. Fortunately, however, on the following day the mule floated to the surface, and the carriage was recovered unharmed.

No more fighting occurred till the 13th, by which date the 2nd Brigade had been halted for two days at Sado while the Panjkora river was being bridged.

13th April. On 13th Lieutenant Edwards came into camp about 10 a.m. and, from his account of the state of affairs at Umra Khan's headquarters, it was thought that there was no prospect of further fighting, at any

rate, in that neighbourhood. It was therefore a great surprise when, at about 1.30 p.m., the 2nd Brigade received orders to turn out at once and support the Guides, who were being attacked by two large bodies of the enemy. The Guides had crossed the Panjkora by a temporary bridge on the evening of the 12th, and had started up a valley on the Jhandoul side early on the 13th to burn villages. During the night of the 12th the temporary bridge was washed away, and there was then no means of communication across the river except a small mussuck raft on which some four or five men could cross at a time with great difficulty and danger. Consequently, when it was known that the Guides were being attacked, all that could be done was to send troops along our side of the river to support them by firing across it. The position which these troops took up was about three miles from camp, and, most fortunately, it was such as to command a view of the spur along which the Guides were retiring at a range of from 1900 to 800 yards. They reached this position at about 2.30 p.m., and No. 8 Mountain Battery came into action on some high ground above the river while the infantry lined the banks below. At this time the Guides were firing occasional volleys, and a few of the enemy were to be seen on the hilltops.¹ "For some time it was very difficult to see for certain which were our men and which the enemy, as both kept pretty well under cover, and little could be seen beyond puffs of smoke.² Presently the enemy grew bolder and showed in great numbers. The guns then began to fire more rapidly and with right good effect, directing their shrapnel here and there as occasion demanded. The ranges were from 1400 to 1700 yards. Their fire soon relieved the Guides from any severe pressure and enabled them to retire deliberately and slowly. . . . At 4.20 p.m. the battery (No. 8) came into action in their second position, opposite the end of the spur which the Guides had just descended, and presently commenced to shell a village some 1400 yards distant from which the enemy were firing, the shells appearing to go plump into the buildings, raising clouds of dust while the firing from that point quietly ceased."

No. 2 (Derajat) Mountain Battery left camp at the same time as the rest of the troops, but were, for some reason, ordered to halt after going a short distance, and were not brought into action till about 4.30 p.m., when they took up a position on the river bank nearly opposite the Guides' camp, and made excellent practice at sungurs and bodies of the enemy at ranges varying from 650 to 3100 yards.

By the time the Guides reached their camp, night was falling, and, as the enemy remained in force in the neighbourhood, evidently much elated at the result of the day's proceedings, it was considered almost certain that they would make a night attack. Consequently, the Derajat battery and some companies of infantry remained in position to afford what support they could from across the river. What actually transpired is described as follows by the *Englishman*. "From information received on the following day, it appears that we were right in surmising that the enemy intended rushing the riverside camp, for a cap-

¹ *Morning Post*.

² The Guides are armed with Martinis, as are all the Native infantry at present

tured Pathan gave the following story. . . . 'Even the severe handling by the supporting force did not stay them and, at nightfall, 3000 were waiting in the cornfields for the signal to rush the camp. But suddenly the night was turned into day, and then again and again, and our courage forsook us.' The 'night into day' was the effect of the star shell which the Derajat battery sent over them. And thus the Guides were saved from a tight place."

14th to 16th
April.

At daybreak, on the 14th, the enemy were seen to be still in force, but, after keeping up a heavy fire for about twenty minutes, in the course of which Captain Peebles was mortally wounded, they melted away altogether. In the action and during the night and morning following the expenditure of ammunition was:—

			Ring.			Shrapnel.			Star.
No. 8 Mountain Battery	...	...	12	...	...	81	...	...	—
No. 2 (Derajat) Mountain Battery	...	—	...	...	...	72	...	...	7

The Derajat battery remained covering the Guides' camp from 13th to 15th without kits or shelter of any kind, and, as there was a great deal of heavy rain on those days, they had anything but a comfortable time.

On 14th April No. 3 Mountain Battery, who were at Khar, received orders suddenly at 3.40 p.m. to march without delay and join the 2nd Brigade at Sado. They were off by 5 p.m. and marched that night to Chakdarra, about 8 miles, crossing the Swat river. Next day (15th) they marched 24 miles to Sado where they arrived full of go at about 3 p.m.—a pretty smart performance over bad roads.

17th April.

No further advance was made till the 17th when the 2nd and 3rd Brigades crossed the Panjkora by the new suspension bridge. From this time the lead was taken by the 3rd Brigade. After marching a few miles in the direction of Mundia (Umra Khan's headquarters) they came in sight of a very numerous enemy.

The passage of troops over the bridge had been very slow as infantry had to cross in single file while, in the case of mules, only three were allowed to be, at one time, on the bridge which had a span of 95 feet. Consequently it was almost mid-day before the action commenced.

There was some misunderstanding about the succession in which troops were to cross, and I believe it was by a piece of simple luck that the Derajat battery went over ahead of the other batteries.

From the bridge to the place where our troops assumed fighting formation was about six miles and the battery did most of this distance at the trot, a pace of manœuvre not generally recognized in Mountain Artillery, in order to catch up the infantry who had got a long start of them from the bridge. I happened to be standing near the Headquarter Staff when it was reported to General Gatacre that the battery was coming up and general astonishment was expressed at the rapidity with which they had covered the ground.

The action—called Mamagai—was not a very sanguinary affair as the enemy appeared to have but little stomach for the fight and, although they were possibly in greater force than on any previous occasion, they kept at a discreet distance and offered a very tame opposition to the advance of our infantry.

The Derajat battery occupied two positions and fired 18 ring and 28 shrapnel shell, making good practice and very quickly dispersing the enemy. The latter at one period had occupied a small fort on a high bank of the river from which they were directing a very harassing fire on our cavalry in the river bed. The battery turned its fire on to the fort—range 1850 yards—and a few shell were burst just over the parapet with the result that the enemy were quickly seen streaming out at the back—a striking difference from the tenacity with which they stuck to their sungurs on the Malakand under fire of three batteries.

This was the last action of the campaign. Next morning (18th April) Mundia was occupied without a shot being fired, Umra Khan and his following having left for Afghanistan the previous evening.

On arrival at Mundia, General Low, having received news that the Chitral garrison were in great straits, ordered General Gatacre to push on with all possible speed with a flying column consisting of—

The Buffs.

4th Ghorkas.

No. 2 (Derajat) Mountain Battery.

$\frac{1}{2}$ No. 4 Company Bengal Sappers and Miners.

2 Maxim Guns.

The Derajat battery drew on No. 8 Mountain Battery to fill up its deficiencies of ammunition.

This column moved forward the same evening starting at 3 p.m. and arriving at dusk at its camp near Barwa—about 10 miles—the battery mules having been saddled for 12 hours.

On 19th April the column started to cross the Janbatai Pass. From the accounts given by Lieutenants Fowler and Edwards, who had been brought along this road, it was thought that the pass was a fairly easy one. It proved to be anything but easy. The troops took from 5.30 a.m. to 4.30 p.m. to reach the top while very little of the transport got up at all that day. The Buffs went down the other side of the pass for a distance, but the Derajat Battery and the Ghorkas bivouacked on the summit of the hill that overhung us.

One incident of the bivouac was connected with some doombas (mountain sheep) the joint property of the G.O.C. and the Political officers. Somehow these sheep strayed and were never found. Many a hungry officer thanked his patron saint that night for a mouthful of mutton: but the brigade orders next day contained some very stringent orders under the marginal heading of 'loot.' "

On 20th April the baggage all came up and the Battery moved on and joined the rest of the force at Bandagai—about 8 miles ahead.

On 21st the column started at 5.30 a.m. to try and get to Dir—about 23 miles. The march was a most trying one, constant stoppages being made while the sappers made the road practicable. At last, at 7 p.m., the advanced portion of the column halted for the night at Kotke, two miles short of Dir, while the remainder halted a few miles further back, half the battery being with each. A heavy thunderstorm, about 4 p.m., drenched every one to the skin and made the going worse than ever. The advanced party fared best as they came in for a square meal provided by the Khan of Dir consisting of cooked delicacies for the

officers, and sheep, goats, fowls and ghee¹ for the remainder, and most welcome they were.

On this day news was received that the siege of Chitral had been raised and there was no more occasion for forced marches. Subsequently the Derajat battery crossed the Lowarai Pass (10,500 feet), marched to Chitral with the 3rd Brigade and took part on 16th May in the parade of the Chitral garrison and the two Relief Columns.

On the whole the equipment, ammunition, etc. of the Mountain batteries appears to have given great satisfaction. Major Cunningham remarks that "The time and percussion fuze No. 55 Mark III. acted admirably. Shrapnel shell Mark III. often failed to break up, the bullets remaining intact in a mass in the resin in the body of the shell. I found two like this at Malakand, the fuzes of which had evidently acted quite properly. Ring shell good. Mekometer very useful." Captain Parker says "The star shell fuzes seem to require an improved uncapping arrangement as, in the dark, the priming frequently strips off with the cap unperceived. I attribute 2 blind star shell out of 7 fired on night of 13th April to this cause, proof of which was afforded by the 8th shell loaded but not fired and subsequently unloaded."

The shooting seems to have been conducted generally on the lines of the latest instructions. Major Shirres says that "It was sometimes necessary to find range and fuze for one central part, then others were estimated and corrections made according to observation. This was necessary to save ammunition, as many points were shelled and the exact spot to be fired at changed constantly according to the enemy's movements. As observation was very easy this system seemed to act well." Captain Parker found that "the enemy frequently made off too quickly to allow of the ranging system being carried through. The regulation system had to be adapted to circumstances."

¹Native butter.

MORE BRIEF CONSIDERATIONS

ON

COAST DEFENCE.

BY

LIEUT.-COL. D. O'CALLAGHAN, R.A.

To many gropers in the dark, General Geary's paper in the R.A.I. "Proceedings" of December last (No. 12, Vol. XXI.), must have come as a boon and a blessing. People walking in darkness, of which the terrors are not only caused by the absence of light, but by its being thronged by grim spectres and fearsome bogies, invoked and invested with sinister power by those who hug themselves in the fond belief that the garrison gunner must, of necessity, be a scientist, and a mathematician of a very high order to boot.

Here, in General Geary's paper, is the whole art of Coast Defence, stripped of its verbiage, its calculations and its formulæ. A hostile critic would probably call the style of the article fragmentary—but so is that of the book of Proverbs, to say nothing of the later contributions, in staccato treatment, of Mr. Martin Tupper. In the pithiness of the style—in the absence of redundant word making—lies the force and the usefulness of the article.

Generalities—and nearly all sets of conditions obtaining in Coast Defence conform to broad generalities—are grasped by a bold and masterly hand, their leading features dissected out, and a few simples prescribed to meet each case. An enemy's vessel is looked upon by General Geary much in the light in which the younger Mr. Wemmick regarded a church. "Here," he virtually says, "is a ship—let's hit it." He does not send for his book of confidential photographs that he may identify this vessel with that which the Coast Brigade signalman has pronounced it to resemble, nor does he scan the description of the amount of plating carried by the supposed ship, nor divide it into squares and assign to each its own appointed projectile, carefully discriminating between the various thicknesses of metal covering these imaginary rectangles. He does not do this, partly because it may have occurred to the enterprising captain to disguise his ship as a North German Lloyd Liner, or as a steam trawler, according to size; but mainly because the ship, should she wish to do so, would have passed far out of range and possibly out of sight, before his dispositions for the proper distribution of fire, and his calculations as to the chances of the various projectiles selecting their appropriate squares, were completed. No—this nicety in the choice

of missiles is, he says, *illusory*, and many perturbed spirits who have dared to think, but not to give expression to their thoughts, will thank him for that word. Common sense and common shell are the things to use, and the way to use them is to hit the ship as often as you can.

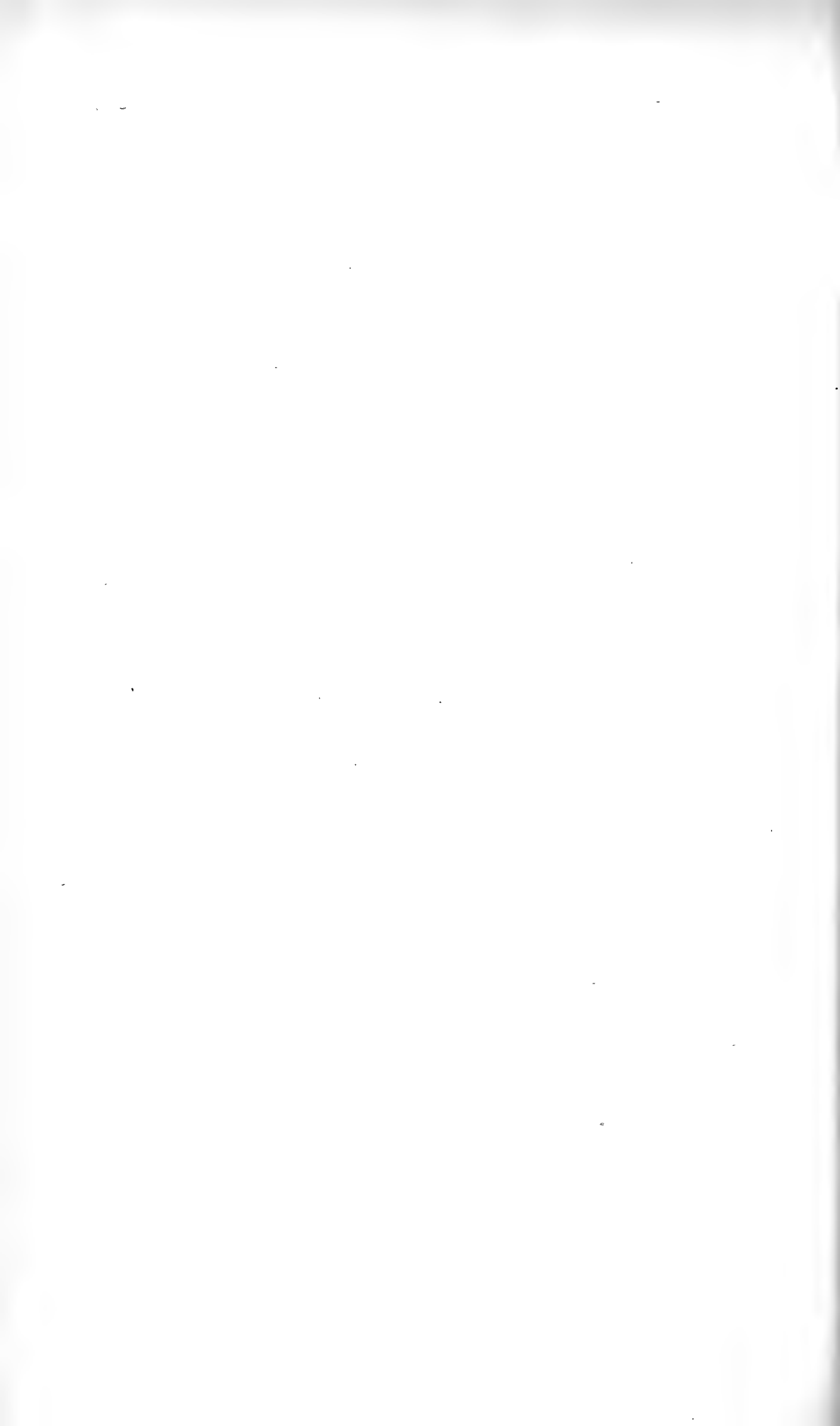
From the foregoing it will be seen that, not only do I cordially agree with General Geary's maxims, but that I rejoice in the freedom and incisiveness with which they are set forth, and this I think I may be permitted to do without suspicion of presumption or of unctuous flattery. But I would go a little further than he and try to deal with possible results. In no work, treatise, pamphlet or discussion have I seen or heard analysed the difference in the *rôle* of a man-o'-war and of a Coast Defence battery when engaging a hostile vessel—but they are vastly different. The man-o'-war fights his adversary with a view of sinking, disabling, or capturing her, the last being usually the corollary of the second, and the end most devoutly sought. The fort, on the other hand, fires at the ship in self defence or to prevent her forcing a narrow passage leading into waters where her fire may be productive of danger. The landsman would like to sink the ship—would be glad to see her disabled—since this would cause inconvenience to the enemy; but his main object is, as an Irishman would express it, “to make her lave that”—he has no idea of effecting a capture. Given a disabled ship which, from want of knowledge of the local resources, has struck her colours, what is the officer in command to do? He cannot tow her in with the garrison boat—the Sappers would probably find it inconvenient to lend one of their Submarine Miners, the A.S.C. boats would doubtless be under repair, and he would hesitate, for obvious reasons, before putting a prize crew on board under the command of a yachting subaltern. He wants to cripple and to send her away limping and innocuous, and it seems to me that if he keep on hitting her all over with common shell, she will not make a lengthened stay in the vicinity of that fort.

Look at any battleship, or any so-called protected cruiser, and see how exposed to the effects of bursting shells is a very large proportion of her crew. The auxiliary armament, such as the 6-inch and 4·7-inch Q.F. guns is shielded by thin (about 4¼-inch) steel plates, while the smaller Q.F. and machine guns are practically unprotected. It may be urged that the crews may be withdrawn from this part of the armament, but they cannot take their guns with them, and a ship, using her turret or barbette guns only, would not engage a modern, well armed fort with much prospect of success. The ship, therefore, should one ever attack such a fort (which is highly improbable), may be considered as all target, and common shell may be fired at all parts of her indiscriminately, with the full hope of inflicting the class of injury we most desire; while the armour piercers, should any properly so-called have been issued, may be reserved for the *coups de grâce* if her disabled condition prevent her from “laving that.”

A word next as to high angle fire. It is tacitly admitted that a ship can do no damage in the way of long range bombardment unless she anchor stem and stern—and very little then. But it is to prevent her doing this little that the system of high angle fire from heavy howitzers

has been inaugurated. It goes without saying that *we* should find considerable difficulty in hitting a ship at say, 10,000 yards, by fire from such howitzers, unless *she* anchored stem and stern, but even at that range, our fire is quite accurate enough, thanks to Colonel Watkin, to prevent her doing so.

Here again, however, there has been an attempt to paint the lily—to gild refined gold—by devising a special projectile for piercing the steel protecting decks and bursting in the entrails of the devoted cruiser. If any of my readers have ever been on board a man-o'-war, be she line of battle ship or cruiser, they will surely see the futility of expecting a shell, in obedience to the wish of the firer, to avoid the superstructure, boats, torpedo nettings, spare spars and all the heterogeneous mass of gear scattered about her upper works, and to steer a tortuous, intricate path down to the steel turtle deck, to penetrate it, and to burst, having kept its percussion fuze inactive until this supreme moment! Is this not crediting an inanimate thing with rather subtle powers of discrimination? This fad has, I trust, been abandoned and its spirit finally laid to rest. As in the case of direct fire, therefore, common shell with large bursting charges, probably of high explosive, will be the only projectile, and these the garrison gunner may cheerfully launch into space, without the hampering thought that he is asking them to do rather more than he would expect of his terrier, did he enter him at a badger in a difficult earth. Let him take courage to himself, and, when the time comes, let him say with General Geary (and Mr. Wemmick), "here's a ship, let's hit it."



A NEW METHOD OF SETTING THE TYRES OF WHEELS.

BY

MAJOR G. P. OWEN, R.A.

It may be of interest to some of my brother officers to know that a new method of setting the tyres of wheels has been invented and is now being introduced in London.

The advantages claimed for the machine are that it sets the tyres cold, quicker, cheaper and better than any other known method.

When it is realized that the average period in which an omnibus wheel requires re-tyring is three months, it will be understood what a large field is open to a machine doing what West's¹ Tyre-setter claims to do.

The machine is in two parts, together weighing 5 tons.

The Tying machine itself consists of a stout Bessemer ring, about 62 inches in diameter. Around and inside the circumference of this ring are some 18 hydraulic rams set at equal distances and in pairs on the opposite ends of the interior diameters of the Bessemer ring.

The second part of the machine is a double pump for working up the requisite pressure, and this requires a force of 4 h-p. to work it. The fluid employed is oil. When it is required to set the tyre on a wheel, all that is necessary is to place the wheel resting on the interior with its hub over the centre of the ring and the tyre outside the wheel.

Blocks of cast-iron of the requisite thickness, according to the diameter of the wheel to be tyred, are then dropped round the outside of the tyre, one opposite each ram.

The pressure is then applied and the tyre is gradually compressed until it fits the felloes accurately, the whole process not requiring more than half a minute.

The metal does not rebound when the pressure is removed, nor is the metal injured in any way.

When under pressure the metal of the tyre sheds small filings and it is claimed that the metal is rendered more homogeneous and harder, the wear of the tyre being in consequence much increased.

On the face of it the method would appear to be a great advance on the present system of shrinking the tyres on.

¹ This method has been adopted and a fully equipped machine has been installed in the R.C.D. Royal Arsenal Woolwich for some months.—*A.J.A.*

THE AMMUNITION SERVICE OF A FORT.

BY

MAJOR R. F. JOHNSON, R.A.

OF late years much has been done to improve the fire of Garrison Artillery. Papers frequently appear in the "Proceedings" describing various methods of increasing the accuracy of ranging and of augmenting fire discipline, but the ammunition service does not seem to have received the attention it deserves. Everyone recognizes the importance of securing uniformity in the charges, and the necessity of sufficient speed in the supply of projectiles, but little or no advance has been made in either direction.

There are several reasons for this. The advantages of large groups of cartridges are obvious to the practical gunner, but the cartridges are supplied by an independent department; the regulations require the oldest cartridges in store to be used for practice, the amounts so used are generally very small, and consequently groups are becoming less in size. The structural conditions of the older forts present difficult problems, for the solution of which other duties of the Majors in charge leave little time. The practice of supply from the stores to the guns entails much fatigue work in replacing the heavy projectiles, especially where lifts are used, as few of them are made to take the shells down from the gun to the magazine floor. Ammunition drill is not required at inspections, and gun-drill, which is, takes up all the time spared from bayonet exercise, marching-order parades, employments, fatigues, &c. The whole subject is dry, uninteresting until understood, gives trouble and occupies time without affording a show in the end. The spirit of the age passes it by.

The system of supply to the forts requires reorganization, and the principles of construction, on which the system of supply from the stores to the guns depends, want regulation, in some of the older forts perhaps alteration, but this paper is designed chiefly to assist officers in dealing with the subject under existing conditions.

However perfect the system of supply and the construction of the work, a thorough organization of the service is necessary, and the first step in this direction is a proper system in the storage of the ammunition.

¹ A group of cartridges is composed of cartridges of one nature filled on one day with powder of one lot; that being considered the greatest amount of uniformity attainable.² Now, it looks neat and also

¹ The following amendment to "Regulations for Magazines, &c.," 1894, will shortly be published or included in the next revise of that work:—

Part II., section II., paragraph 223 (b) :

"Filled cartridges, in groups which will be as far as possible, identical in nature and age. *The age of the cartridges to be reckoned from date of filling and grouped by years. If there is a sufficient number of cartridges of the same lot, they may be grouped separately.*"—Communicated by D.A.A.G., R.A.

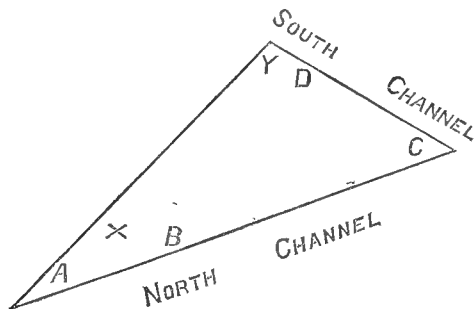
² Since this was written, the Regulations, as stated in note 1, have been altered and cartridges are now grouped by years of filling. This facilitates the supply to the artillery and gives an appearance of uniformity as the groups will be larger. If an officer, however, desires to ensure accuracy of shooting he will sub-divide his groups by day of filling and lot of powder, and therefore I leave the paper without alteration.

saves trouble at inspections and examinations, if there are only one or two groups in a cartridge store. Consequently it is no unusual thing to find the following arrangement:—A group of three guns served from two stores, having, say, five ammunition groups composed of 100, 75, 15, 20, and 90 cartridges. One store holds 100 cylinders; the Master-Gunner therefore puts the first group in it. Is this right? Not unless one store is made the expense one for the whole gun group, which in some cases would lessen the speed of supply too much. If the guns are fought with separate P.F.'s it would not much matter, unless the P.F.'s were used as D.R.F.'s when the Battery Commander would make the corrections. If the gun group is fought by one range instrument, P.F. or D.R.F., and both stores are used as expense, as will generally be the case, then it is decidedly wrong, because the difference in the charge of the third gun will upset all the ranging. One of the stores in this example should have one-third and the other two-thirds of each of the five ammunition groups.¹

Another example of the same error may be found where, say, two gun groups fought by one range instrument are supplied with cartridges from the same magazine, particularly when the supply is by different hatches. Here instead of the supply of both gun groups being from one cartridge group it will be found that groups of cartridges have been placed near one hatch, which are different to those near the other.

This leads to my first proposition, which is, that *the range-finding arrangements of a fort should govern the distribution of the cartridges.* Let me give an example.

I was in charge of a fort consisting of four detached batteries on a triangular island (see diagram) *A*, three guns; *B*, two guns; *C*, one



gun; *D*, three guns; all of same calibre. *A*, *B*, and *C* commanded the North Channel worked by D.R.F. at *X*. *D* and *C* the South Channel with D.R.F. at *Y*. Here it was clearly desirable that *A* and *B* should have uniformity of charge, and that *C* should have it with both *A* and *B* and with *D*. I therefore divided the cartridge groups into two batches, one of 550 and the other of 350 cartridges. Each group of the larger batch was divided into 11 parts, of which *A* had six, *B* four, and *C* one. *D* had six and *C* one part of each group of

¹ Groups of cartridges, or of shell, or of tubes, &c., are now all called ammunition groups, but it would be simpler and clearer to call them cartridge groups, &c., and to only use the term ammunition group for fixed ammunition.

the smaller batch. The distribution was simplified subsequently by the provision of a third D.R.F. for *C*, whose store then received all the small groups.

The small indivisible groups were a difficulty, and the regulation requiring the groups in each store to be numbered according to the date of receipt prevented simplicity in the orders for the ammunition officer. Thus in *A* store a small group of 5 came after group I.; therefore group III. in *A* store was identical with group II. in *B* store, and it was impossible to make the numbering in *C* store identical with that in any other except in the case of group I. which was the same as group I. in *A* and *B* stores.

¹ The numbering of groups according to dates of receipt or age is not really necessary, nor would any harm or confusion result if the numbering in a store did not begin with I. The largest group is the one first in action and it should have the lowest number. *The number is really only a name and my second proposition is that it should be treated as such and no restrictions placed on the naming of any particular cartridge group.* With this latitude in the example just given, supposing there were five cartridge groups divided between *A*, *B*, and *C* stores, the largest would have been I., and the largest in *D* store VI. The small group of five cartridges in *A* store would have been numbered after those in *D* store. Then the orders for the ammunition officer would have been:—"Issue to all guns from lowest numbered group in each store taking care when *C* works with *D* it has identical cartridges as shown by the group numbers or names. If a group becomes exhausted in any store pass to the next, making the change in the other stores at the same time, and inform the Battery Commander as to the difference between the groups."

One more example may be of use. In a fort (Plate I.) gun groups *D* one gun, *E* two guns, and *F* two guns, all of one calibre were served from cartridge stores Nos. V. and VI. Groups *D* and *E* were worked by one range instrument, group *F* by another. Cartridge store No. V. held 400, No. VI. 100 cylinders. No. VI. was assigned to *F*2; *F*1 drawing from No. V. This arrangement prevented uniformity of charge in *F* group, and there was no advantage in having *F*1 gun uniformly loaded with the other groups. I therefore made No. VI. expense store for *F* group, the ammunition officer being directed to fill up from No. V. store as required. Here, however, the regulation numbering of groups again interfered, for there were several groups in No. V. store, and the oldest were not the largest. The ammunition officer will have to be told to use, say, groups V., VIII., IV., VI. for *D* and *E* groups, and to fill up No. VI. store with groups VII., IX., X. It is extremely difficult to arrange the stacking in such cases, as the

¹ The numbering of the groups according to dates of receipt or age, is intended to serve a double purpose:

(a) To ensure a reasonable amount of uniformity in shooting in each series.

(b) To ensure the regular turnover of the ammunition.

The revised edition of Equipment Regulations which will probably be issued this year, contains the following instructions at Section XII. of Part II., paragraph 186:

"For all practice the ammunition of oldest manufacture and that contained in packages which have been opened for inspection, will always first be expended, and will be replaced by the next supply from store."--Communicated by D.A.A.G., R.A.

groups must be arranged round the store in numerical order, and the result of much thought and trouble is altogether unsatisfactory, which is the more annoying when the remedy is so simple.

¹ Of course very small cartridge groups should never form part of the equipment ammunition. What is wanted is *that no groups² shall be issued to the Artillery which are not large enough to give at least 25 cartridges to each gun fought by one D.R.F. or one group of P.F.'s.* This is my third proposition. The groups of the equipment should not be broken into for station or any other practice, but the powder for practice should be supplied from cartridge groups marked for change by the Inspector of Warlike Stores, a whole group being exchanged at one time. The cartridges can of course be broken up and remade to suit various calibres used for practice.

There is a corollary to my first proposition that deserves notice before leaving the subject of cartridges, viz :—*that the cartridges should be considered in determining the number and distribution of range instruments.* That it is possible to instance a battery of 10-inch R.M.L. and 10-inch B.L. guns provided with only one D.R.F. for the whole, is a slight to “the spirit of Artillery,” it will not forgive if occasion arises. A lot of powder will make into 200 9-inch R.M.L. cartridges or 25 each for 8 guns, and therefore eight is the limit of the number of 9-inch R.M.L. guns to be fought by one D.R.F., while for 10-inch and 11-inch R.M.L. the numbers are six and four.

The grouping of projectiles is simpler than that of cartridges, for although the regulations divide them into groups of one nature of one mark filled on one date, the date of filling makes no difference in shooting and can be disregarded in numbering the groups; the regulations being sufficiently complied with if the shells of different dates of filling in a group are slightly separated and a record of the dates kept on the inventory board of the store.

The “Garrison Artillery Drill” says that it is desirable that a store should only supply to one gun group. I would go a little further and add, it is desirable that the supply to a gun group should be from one store.

I once found in a circular fort the two guns of a group supplied from different shell stores. There were separate lifts and the stores were near them and next each other, but unfortunately on the magazine floor the passage was interrupted between the two. Consequently orders for shell had to be sent separately for each gun and the *personnel* required was very large. I therefore made room in one of the stores, by forming a third into its reserve, for nearly all the shell of the gun group. Of course, if this had affected the speed

¹ There are insurmountable difficulties in the way of carrying out this excellent proposal, if date of making up the cartridges is to determine the group; but it may be remarked that the amendment to the Magazine Regulations quoted in note 1 p. 517 is considered to be the closest approximation to a solution of this difficulty which is really practicable. Many cases of small groups have been closely investigated, the worst that was brought to notice however proved that though the number of small groups appeared excessive, yet the actual difference in shooting of the different groups did not nearly approach the limits of error of the gun as shown by the 50 per cent. rectangle.—Communicated by D.A.A.G., R.A.

² Of course the cartridge group intended here has the uniformity of day and lot. A lot is 10,000 lbs. It is the constant consumption of small quantities that creates the difficulty of supply.

Range
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$\frac{C}{3}$

Gun
Floor

Q F Amm. No 10 hook

Cartridge No 9 Case

No 8
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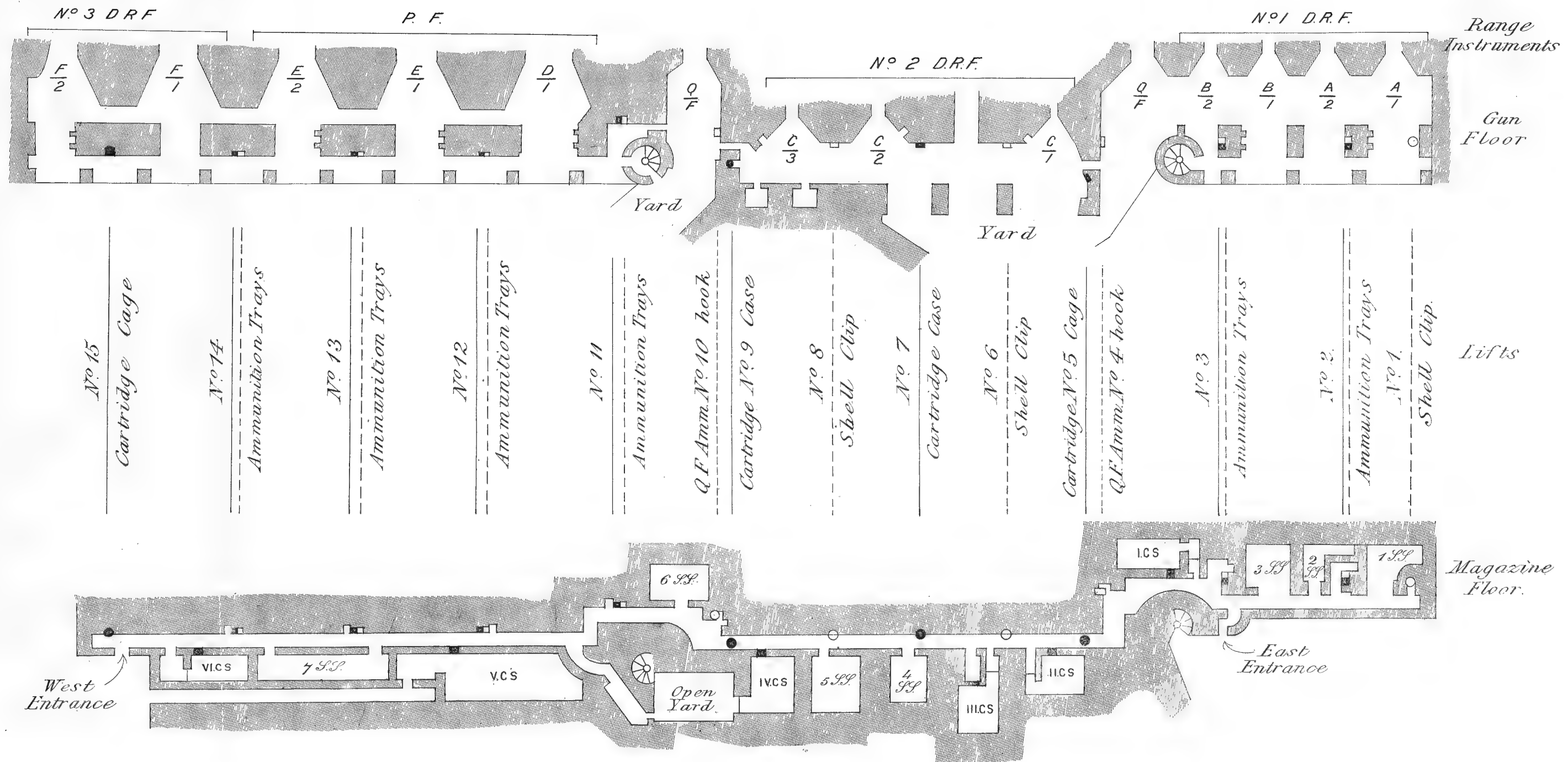
Magazine
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Plate 1.



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of supply, and the speed of supply in the first instance had been sufficient, this would have been wrong, but in any case the formation of a *depôt* was necessary and the lift from the emptied store was not of a safe description. The change simplified the service and made a large reduction in the *personnel*, and also facilitated an arrangement of stores otherwise desirable.

As there are different natures of projectiles for each gun it is not possible to reduce the orders for the ammunition officer quite to the same simplicity as it should be in the case of cartridges. You cannot say, "begin to supply from group I. and go on." But the groups of each nature are kept together and therefore the order can be, to begin with the lowest numbered group of each nature.

The same rule applies to the distribution of marks of shell as to groups of cartridges. For instance if a battery of 9-inch R.M.L. guns with more than one shell store has its complement of shell, composed of some steel common and some iron common, each lot must be divided among the stores in proportion to the number of guns supplied from each of them.

It is necessary that every cartridge cylinder and every shell should have its group designation marked on it. It is not sufficient to mark one or two of a group as they may be issued early in an action.

There is not much to say about the grouping of tubes and fuzes; but I think *it would be better instead of putting them in the shell stores, serving rooms, or recesses for action to have a dépôt for each D.R.F. or group of P.F.'s, i.e., for each collection of guns whose fire is directed by one officer, and to have a R.A. gunner or a N.C.O. for each dépôt to distribute to Gun Captains.* This is my fourth proposition. It would simplify the service and lessen the chances of mistakes.

In the last paragraph I find I have passed from the subject of storage to that of the organization of the supply to the guns, which is the second step in the direction of establishing a systematic ammunition service.

Guns must not be kept waiting for ammunition, but at the same time the *personnel* employed in its service must be kept as low as possible in its numbers, both to avoid confusion and on account of want of men or barrack accomodation. I know of a fort, of which the full ammunition details would amount to nearly, if not quite, 300 officers and men, and in the case of Plate I., with 14 pieces of ordnance a complete service would absorb 117 or just over 8 per gun or 38 per cent. of the garrison (Table I.). With all these men it would be good work to put 10 rounds per gun on the gun floor in half an hour. This is not quick enough, if the rate could be maintained and there was no danger of confusion, both of which points are doubtful. The service of cartridges need cause no anxiety, but directly it becomes a question of moving heavy projectiles from one level to another sufficient speed cannot be obtained without a very large *personnel* or extraordinary mechanical appliances.

The drill-book recognizes this by directing the formation of *depôts* before action, but it only gives want of speed in the case of lifts as a reason, and my experience is that the great importance of the direction is not fully appreciated, as nearly all manning tables make provision for a shell service. My fifth proposition is, *that shell depôts shall al-*

ways be formed unless the gun details can take the shells out of the stores themselves. It reduces the *personnel* by about one-half, simplifies the supply and enables a more complete cartridge service to be arranged. The greatest saving is at the top of lifts, because with shell it is necessary to have sufficient men there to take them out and put them on one side, whereas with a simple cartridge service the gun details are sufficient.

In most cases there is no difficulty in finding suitable sites for these depôts, but in some, recesses or other protected places should be made. Their size depends on the probable consumption during action, which is governed by local conditions; the lighter the nature of the gun the greater the number of rounds; works subject to bombardment will be longer in action than those an enemy will run past; guns behind ports in curved works will not fire as often as those with larger training arcs.

The drill-book suggests placing Palliser between shells in the depôts to lessen the danger of explosion, but the danger of explosion seems to me small and the chance of mistakes large.

Gas-check and a wedge-wad for every projectile on the gun floor must be placed at the shell depôts when they are formed.

Economy in *personnel* as well as speed in supply should really be taken into consideration in the design of works, but in the majority of cases there is not much indication of it having been.

My sixth proposition is *that the ammunition details should be divided into sections corresponding more or less with the gun details they serve.*

There has been a tendency, for which the form of our manning tables is somewhat to blame, to mass the ammunition details together and to regard the whole as quite separate from the gun details. I think this militates against due co-operation in fighting a fort and often prevents economy in *personnel*. It certainly necessitates a great deal of explanation on the manning table and increases the difficulty of getting the men into their places. In many cases if the ammunition details were divided as I propose it would be possible for the Gun Group Commanders to supervise their own ammunition supply which would often, if not generally, be advantageous.

Every organization for fighting requires testing by practice, and there must be someone in command or assisting the commander who is thoroughly conversant with all the details. Therefore it is desirable (1) that in each fort with lifts there should be at least one by which shell can be returned expeditiously and safely to the magazine floor;¹ and (2) that the Master-Gunner should belong to the ammunition details.

A description of the organization proposed in the case of a fort as shown in Plate I. may serve to illustrate what has been said.

STORAGE.—*Cartridges*: *A* and *B* groups in No. I. cartridge store. *C* group in No. III. cartridge store. *D* and *E* groups in No. V. cartridge store. *F* group in No. VI. cartridge store, with reserve in No. V. cartridge store. Each store to have at least one large group of cartridges. *Palliser*: in gun emplacements. *Shell*: *A* group in No. I. shell store. *B* group in No. III. shell store, leaving No. II. shell store empty for reception of empty cylinders. *C* group in No. V. shell store,

¹ Conditions excluding chain lifts with clips.

with reserve in No. IV. shell store. *D*, *E*, and *F* groups in No. VII. shell store with reserve in No. VI. shell store. *Case shot*: in gun emplacements arranged as seats for the detachments. *Tubes and fuzes*: in central dépôt in four divisions, I. for *A* and *B* groups, II. for *C* group, III. for *D* and *E* groups, IV. for *F* group. *Quick-firing ammunition*: in case shot stores. Nos. II. and IV.

SUPPLY.—*Shell*: 25 rounds (20 common, 5 shrapnel) for each gun placed in dépôts by the ammunition details assisted by the gun details (Table II.). These dépôts to be placed in the verandah behind each gun, except in the cases of *C.2* and *C.3* where there are large recesses available.¹ *Gas-checks* and *wedge-wads* are also placed at the dépôts. *Cartridges, tubes, fuzes* and *quick-firing ammunition* supplied during action (Table III.).

Disposal of empty cylinders: *A* and *B* groups in shell store, No. II. *via* lift No. 1. *C* group in yard behind on gun floor level. *D* and *E* group in yard on right rear on gun floor level. *F* group in yard by west entrance to magazine passage, *via* lift No. 15.

LIFTS to be assigned *during action* as follows: No. 1, with improvised hook, removal of empty cylinders *A* and *B* groups. No. 2, *A* group. No. 3, *B* group. No. 4, quick-firing ammunition. No. 5, *C.1* gun. No. 6, not used. No. 7, *C.2* gun. No. 8, not used. No. 9, *C.3* gun. No. 10, quick-firing ammunition. No. 11, not used, so as not to block communication or impede disposal of empty cartridges. No. 12, *D* group. No. 13, *E* group. No. 14, *F* group. No. 15, removal of empty cylinders *F* group.

AMMUNITION DETAILS to be divided into three sections. *No. I. or C Section*, parade by east entrance to magazine passage; gun floor detachment proceeds by steps not shewn. (*Note*—This is No. I., because it has to pass through part of magazine passage in which No. II. works and it is desirable it should go in first). *No. II. or A B Section*, parade on left or behind No. I.; enters magazine passage by east entrance; gun floor detachment proceeds by circular stairs. *No. III. or D E F Section*, parade by west entrance to magazine passage; gun floor detachment proceeds by magazine passage to small yard outside No. IV. cartridge store and thence by circular stairs. *Tube and fuze servers*. One N.C.O. at central dépôt, one man carrying to Gun Captains for each division (*see* STORAGE). The whole under the command of an officer, whom the Master-Gunner will assist, when lamps are lit, stores issued, and permanent staff placed.²

Probably the organization described is capable of much improvement. It has not been tested by practice, and, if I may be allowed to say so, any accounts of actual experiments would be valuable contributions to the "Proceedings." A thorough knowledge of the ammunition service is of very great importance to the Garrison Artillery, for without it all

¹ Objection may be taken that the positions are exposed, but they can only be reached by direct fire and the projectile must first enter by a small port and strike either the gun or its mounting. In the cases of *D*, *E*, and *F* groups positions behind the traverses might be safer, but inside the emplacements they would impede communication, and in the verandah it is necessary to keep the tops of the lifts clear for the cartridge service.

² In Tables II. and III. the details are enumerated in the order they should stand in on parade. To enable this to be done the column of duties in the manning tables should be left blank. The plate is in many respects imaginary, but it is not exaggerated.

time and thought expended on the production of its material and on the augmentation of the accuracy of fire may be rendered useless.

TABLE I.—AMMUNITION SERVICE FOR WORK.—PLATE I.

DUTIES, &c.	Officers.	N.C.O.'s	Gunners.
Ammunition Officer	1	1	—
Assisting Ammunition Officer	—	6	2
Inside Cartridge Stores	—	—	9
Supplying Cartridges to Lifts	—	—	10
Ammunition Lifts { Top	—	—	12
{ Bottom	—	—	13
Cartridge Lifts { Top	—	—	4
{ Bottom	—	—	4
Shell Lifts { Top	—	—	6
{ Bottom	—	—	6
Inside Shell Stores	—	—	16
Conveying Shell to Lifts	—	—	12
Stacking Empty Cylinders	—	—	7
Inside Quick-firing Ammunition Stores	—	—	4
Carrying to Lifts	—	—	2
Lifts { Top... ..	—	—	2
{ Bottom	—	—	2
Total Ammunition Service... ..	1	6	110
Other Details	13	22	157
Total, Garrison... ..	14	28	267

TABLE II.—SHELL SERVICE FOR WORK.—PLATE I.
For forming depôts before and in intervals of an action.

DUTIES AND ORDER ON PARADE.			Officers.	N.C.O.'s	Gunners.	Officers.	N.C.O.'s	Gunners.
<i>Staff.</i>								
Magazine Floor	1	1	1	—	—	—	—	—
Gun Floor	1	1	1	2	2	2	—	—
EAST ENTRANCE.								
<i>No. I. or C Section.</i>								
Magazine { Superintending	—	1	—	—	—	—	—	—
Floor { Bottom of Lifts 6 and 8	—	—	4	—	—	—	—	—
{ Supplying from No. V. shell store... ..	—	—	6	—	—	—	—	—
Gun Floor { Top of Lifts 6 and 8	—	—	4	—	—	—	—	—
{ Forming Depôts	—	—	8	—	1	22	—	—
<i>No. II. or A B Section.</i>								
Magazine { Superintending	—	1	—	—	—	—	—	—
Floor { Bottom of Lifts 2 and 3	—	—	4	—	—	—	—	—
{ Supplying from Nos. I. & III. shell store	—	—	6	—	—	—	—	—
Gun Floor { Top of Lifts 2 and 3... ..	—	—	4	—	—	—	—	—
{ Forming Depôts	—	—	8	—	1	22	—	—
<i>No. III. or D E F Section.</i>								
Magazine { Bottom of Lifts 11, 12, 13, 14	—	—	8	—	—	—	—	—
Floor { Supplying from No. VII. shell store	—	—	8	—	—	—	—	—
{ Superintending	—	2	—	—	—	—	—	—
Gun Floor { Top of Lifts 11, 12, 13, 14	—	—	8	—	—	—	—	—
{ Forming Depôts	—	—	10	—	2	34	—	—
WEST ENTRANCE.								
Total	—	—	—	2	6	80	—	—

N.B.—The Gun Group Commanders and Gun Captains assist in the superintendence on the gun floor.

TABLE III.—CARTRIDGE SERVICE FOR WORK.—PLATE I.

DUTIES AND ORDER ON PARADE.		Officers.	N.C.O.'s	Gunners.	Officers.	N.C.O.'s	Gunners.
<i>Staff.</i>							
Magazine Floor...	...	1	1	1	—	—	—
Gun Floor, supplying Tubes and Fuzes	...	—	1	4	1	2	5
EAST ENTRANCE.							
<i>No. I. or C Section.</i>							
Magazine Floor	Superintending ...	—	1	—	—	—	—
	Inside Nos. II. and IV. cartridge stores (quick-firing ammunition) ...	—	—	4	—	—	—
	Carrying from No. IV. cartridge store to No. 10 lift ...	—	—	1	—	—	—
	Carrying from No. II. cartridge store to No. 4 lift ...	—	—	1	—	—	—
	Bottom of Lifts Nos. 4 and 10 ...	—	—	2	—	—	—
	Inside No. III. cartridge store ...	—	—	2	—	—	—
	Carrying to Lifts Nos. 5, 7, 9 ...	—	—	3	—	—	—
	Bottom of " " " ...	—	—	3	—	—	—
Gun Floor	Stacking Empty Cylinders ...	—	—	1	—	1	17
<i>No. II. or A B Section.</i>							
Magazine Floor	Superintending ...	—	1	—	—	—	—
	Inside No. I. cartridge store ...	—	—	2	—	—	—
	Carrying to Lifts Nos. 2, 3 ...	—	—	2	—	—	—
	Bottom of Lifts 1, 2, 3 ...	—	—	3	—	—	—
Gun Floor	Stacking Empty Cylinders No. II. shell store ...	—	—	1	—	—	—
	Top of Lift No. 1 receiving Empties ...	—	—	1	—	1	9
<i>No. III. or D E F Section.</i>							
Magazine Floor	Stacking Empty Cylinders, F group ..	—	—	1	—	—	—
	Inside No. V. cartridge store ...	—	—	3	—	—	—
	Bottom of Lifts Nos. 12, 13, 14, 15 ...	—	—	4	—	—	—
	Carrying to " " " " " ...	—	—	3	—	—	—
	Inside No. VI. cartridge store ...	—	—	2	—	—	—
Gun Floor	Superintending ...	—	1	—	—	—	—
	Stacking Empty Cylinder D and E group ...	—	—	2	—	—	—
Top of No. 6. Lift, Empty Cylinders F group		—	—	1	—	1	16
WEST ENTRANCE.							
Total ...		—	—	—	1	5	47

DIARY

OF

LIEUTENANT W. SWABEY, R.H.A., IN THE PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 496, No. 10, Vol. XXII.).)

PART III.

CHAPTER II.

Complaints from Head-Quarters about foraging. Lieut.-Colonel Downman inspects "E" troop. Coursing. Major Gardiner exchanges with Captain Macdonald. Idle days.

25th January.—Dyneley received a letter from the Deputy-Adjutant-General of the division, with an enclosure from Lord Wellington's secretary, containing complaints on the subject of forage from Fama-licoa, to which place Sergeant Wightman had been sent with orders to procure hay and straw. The letter called on Dyneley to state his answer to the complaints of the magistrate which set forth, that a party of ours under a sergeant had entered the houses of the above town, and without applying to the constituted authorities, had taken away the forage, forcing their way through the doors and windows, and, further, without authority, had taken from the inhabitants and used as means of transport their bullocks, some of which had died.

26th January.—Was employed in framing an answer to Lord Aylmer's letter, in which I did not fail to deny the forcible entry into houses, and stated as a reason for the sergeant's not having made regular application according to orders, that we uniformly found that, instead of receiving the necessary assistance from the constituted authorities, we considered any reference to them as only the signal for the removal of the supplies we stood in need of and that in regard to bullocks, unless seized before application was made, they never could be procured. I further justified the employment of bullocks for transport by making it evident that in our crippled state we could not send a sufficient number of horses as was usual for want of men. It was then necessary to set forth the steady character of the sergeant, and to throw some of the blame on ourselves for the sake of saving the man, which we wished very much to do, although he had certainly without any orders committed himself by not applying *pro forma* through the regular channels. If he had done this, and they had failed in assisting him, he would then have been at liberty to act for

himself. It had not, however, been the practice for the reason above stated. To lessen his offence, as well as the commanding officer's, I set forth that an officer (in this case myself) was sent with the party, but not being intended to remain out and it being very late, he had returned. Having thus composed Dyneley's defence, he, in no small stew, copied it and sent it off.

27th January.—Jenkinson arrived on his return from Oporto; the description he gave of it made me very much regret that I had not it in my power to make such a jaunt, but in the present state of the troop it is impossible.

28th January.—Lieut.-Colonel Downman, with Harding, arrived to inspect the troop, sick, etc. From the unavoidable backwardness in our equipment, and through sickness, we certainly did not cut a very great dash, but, after making minute enquiries into the economy of the troop, he sat down and wrote a letter to head-quarters highly expressive of his satisfaction.

29th January.—I was favoured this morning by a *tête-à-tête* with the Lieut.-Colonel, from which I gathered that he intended to propose to Colonel Fisher¹ to reduce the troop to four guns. This intelligence did not of course give me much pleasure, knowing as I did how fairly we were entitled to at least a part of the remount men from Lisbon, in place of killed, wounded, dead, and prisoners, and besides I was quite aware that his differences with Colonel May, the Deputy-Adjutant-General, R.A. were at the bottom of his scheme, the latter being fully determined if possible to equip and complete us. Lieut.-Colonel Downman, however, looked on the arrangement as an undue interference with his command, and therefore, from that moment, was determined to keep down us unfortunates, who were the subject of their disputes. I shall here say nothing of the private civilities he had always received from us, but only condemn his conduct in a public light.

30th January.—We discovered this morning that Corporal Betty, a member of that nest of infamy, the R.A. Driver Corps,² was concerned in selling at the gun-park the very ammunition out of our cartridges. He was fully detected and brought forward by a gunner of the Foot Artillery, one of the guard.

31st January.—Sat as a member on Betty's court-martial of which Jenkinson was president; the rascal's villainy was clearly proved, and the evidence brought forward made me certain that some of the Foot Artillery were likewise concerned. I was glad to find none of the old troop implicated. The purchasing of ammunition is an evil of such a vital nature to the service that, had my advice been followed, the buyer, a Portuguese, would certainly have been given over to the laws as an example.

I always was an advocate for vigorous justice. I conceive its strict

¹ Then Commanding the Royal Artillery in the Peninsula.

² The Driver Corps was formed in 1794, it was an additional corps to the Royal Artillery, but its officers were, until after Waterloo, drawn from a different source, and its men were never Artillerymen. It was abolished in 1822. Duncan's History, R.A., Vol. II., p. 30.

execution to be a duty to society, and that all who forget themselves so far as to let their compassion be an obstacle to it are unworthy of its protection. I never could understand why a thief should be forgiven from motives of compassion. A mind at all in the habit of reasoning would easily see how such lenity would increase the number of thieves, and not only the property of all be the more endangered, but humanity the more injured by giving encouragement to offenders, and increasing thereby the number of punishments. Thus, in this country where the people under us are exempt from capital punishment for thieving, we soldiers see honesty daily falling into disrepute; it is hardly credible how the best soldiers lose their early principles, in this matter, and a fellow who is ever such a thief is sure to be countenanced by his companions.

The arbitrary law of Portugal punishes with transportation to the Brazils the purchaser of any article whatever from a soldier, a sentence not dependent on a jury as in happy England, but on the order of the magistrate who has only the power of taking depositions. This regulation, as it is only temporary, is certainly adapted to the exigencies of the times, because, as a soldier is in the habit of stealing whatever he can lay his hands on, it is the only real security for property. The punishment is not as it first appears out of proportion to the crime, because, as perhaps the soldier sells the value of 4 doubloons (one is worth £3 4s.) for a pint of wine, to be a purchaser might soon become a lucrative trade.

1st February.—Jenkinson, after having enlivened our circle for some days, left us. There is a sort of phlegm about him I cannot understand: he must have been aware that we knew of his brother's misfortunes, and yet he could bear to talk of his going to Scotland for change of air, etc., etc.

2nd February.—Lord Aylmer's answer came relative to the complaint. It was short and pithy. "If the people of Famalicoa are not satisfied in a week's time from this date, the captain, the officer, and the sergeant shall be brought to trial before a general court-martial." For my own part, as I dread few circumstances that do not implicate my character, I believe I should not care if it were to take place. I could anticipate its results without the smallest apprehension; they could be of no consequence to me. First, I could easily prove I never received any orders respecting the party, and secondly, supposing the decision of the court-martial to have deprived me of my commission, that would be only taking away a clog that has served to delay my best and dearest prospects, and if the verdict has been against me I should have appeared in the very proud position of having sacrificed myself for others. Dyneley, however, could not fail, as commanding officer, to be implicated, and though every such person in charge of horses is daily guilty of misdemeanours, that would have been nothing to the "Lord"¹ or to the court-martial, therefore all pride was waived, and how to get out of the scrape was the question!

3rd February.—Early in the morning I started over the mountains

¹ "The Lord," "The Peer," terms by which Wellington was known in the army.—(F.A.W.)

to Famalicoa to endeavour to bring about an agreement with our complainants, and well knowing the value of money in these cases, took a tolerable quantity with me. The road, passing over a considerable part of the Estrella, was very difficult, but the business was urgent and my spurs not to be sneezed at. I did not delay much to admire the mountainous beauty of the scenery. On my arrival I found the principal person of the town who had been at the bottom of the business, and told him I was there to apologise for the conduct of a sergeant, and very carefully admitted all he had reported, which certainly was not much in the man's favour. He seemed, however, to doubt and hesitate a good deal till I pulled out the money and offered to pay all the bullock owners; this seemed quite to open his heart, and he immediately exerted himself on my behalf. At last, through his interest, which was besides somewhat biassed by a letter I took with me from a colonel of Portuguese militia in whose regiment he had a company, I procured a letter from him to Dyneley, expressing his satisfaction for the reparation made, and a certificate from the magistrate to the same purpose. This done, he gave me a good breakfast in the English style, and I started homewards. On my return I crossed the Mondego very near its source. The scene was beautifully wild and romantic, and I had sufficient time to contemplate it owing to the mule I rode knocking up and being obliged to walk. I got to Mello by dusk when, lo and behold, clever! I had lost the certificate, the best and most formal part of the business! I always was a great deal more careless than other people.

4th February.—Went over to Moimenta da Beira to tell Lord Dalhousie¹ what steps we had taken, he expressed himself very indignant at Lord Wellington's severity. I confess I do not see it in that light, because if the latter did not act up to the letter of his orders where would be the security for the inhabitants in regard to payment for their forage, etc. It is true that they do not, by their aid and assistance, merit such steps in their favour, but the prudence or imprudence of an act must be measured in public matters more by its policy than its justice.

5th February.—We forwarded to head-quarters the letter from Famalicoa, resting on our oars about the certificate, having merely stated that one had been given us.

6th February.—Went to Gouveia to attend the funeral of Colonel Collins, who died there a few days ago. He commanded the Portuguese Brigade, of the 7th Division, by which he was attended to his grave. The ceremony was so ill-conducted by the Portuguese troops that the solemnity which generally is so impressive on similar occasions was not at all striking. He was buried in a convent garden. His last disorder was brain fever, but there being a *post-mortem* after his death, a ball was found that had been seventeen years under one of his ribs, three of which on the opposite side had been broken in storming a fort in the West Indies. He was an excellent officer and is a great loss to the Portuguese service.

¹ Lieut.-General the Earl of Dalhousie, Commanding 7th Division,

7th February.—Lord Dalhousie and a large party came to meet us and course near Mello ; lots of cockneys, consequently no sport.

8th February.—Had a tolerably lengthy ride of five leagues to assist a foraging party. N.B.—Set down the neighbourhood of Casal Vasco for the best foraging district, between Celorico, Vizeu, and Coimbra.

9th February.—Major Crespigny¹ dined and brought his greyhounds.

10th February.—Went coursing, and having no cockney incumbrances, killed a leash of hares in great style.

11th February.—On inspection found still more powder stolen. We have the satisfaction of knowing that none of our men have mounted guard over it, which is not a little satisfactory.

12th February.—Went with Dyneley to dine with General Barnes,² whom we found to be a very hospitable pleasant fellow. He even wanted me to sleep in his room, but having taken my own bed, there was fortunately no occasion. In appearance, he put me in mind of General Hay, who, by the way, notwithstanding I was an old Packham acquaintance, permitted me last year to sleep, wet as I was, in my clothes without offering me a blanket.

14th February.—We received letters expressive of the "Peer's" satisfaction at the steps we had taken in consequence of the Famalicoa business. We were not of course sorry to see it terminated.³

15th February.—Bought Newland's chestnut horse "Purbrook," giving him my Spanish brown horse, value 80 dollars, £20, and 300 dollars, or £75 ; so much for coming down with the rhino.

16th February.—Having established a system in the way of conducting the troop business, and finding time begin to hang heavy on hand, I actually read a book ; a history of Charles XII. of Sweden, which was at this moment the more interesting on account of the genius of the Russian government and the history of Peter the Great. His achievements appear almost a romance, for no one ever performed so much in so short a time ; perhaps he was better entitled to the epithet "Great" than any other dignified person, for all his endeavours were characterised by having a laudable and a rational aim. It would be difficult to define a hero without ambition, though many have existed who have been great without grasping at reward. To give the Czar the praise of having been the most useful one that ever adorned society would be perhaps the most just way of describing his title to greatness. That a man uneducated, and apparently without the means of instruction within his reach, and certainly not called upon by any immediate

¹ Major Crespigny, 68th Regiment.

² Commanding a Brigade in the 7th Division. He was Adjutant-General of the army at Waterloo. Governor of Ceylon 1824. Commander-in-Chief in India 1831. Sir Edward Barnes was M.P. for Sudbury. In conjunction with Admiral Sir William Bowles, he founded the Army and Navy Club.

³ The supply of forage in the Peninsula was a common difficulty with commanding officers. Captain E. C. Whinyates wrote : "I risked so much in foraging for the troop during the time I had the command, that, if the Spaniards and Portuguese had not been my personal friends, or had reported me, I should have been tried by court-martial and most likely broke. A friend of mine was tried for cutting down and seizing forage, but was happily acquitted."

necessity to make himself a man of knowledge, should have become a philosopher, an artisan, a warrior, and a politician, and moreover under the disadvantage of being in a country where manufactures and politics were not at all, and philosophy and war scarcely known, is extraordinary. His character and life are the greatest examples of the benefit the human mind derives from being above prejudice, and at the same time a more extraordinary instance of the difficulty, or indeed of the impossibility, of being divested of early religious predilection. Religious bigotry and its attendant tyranny appear to have been the only imperfection in his scheme of government. As refinement is a plant that can only flourish in its natural soil, we must remember before we condemn his want of it that he was really a true native of the Russias; he was, however, so well aware of this truth that he imported from the more advanced nations of Europe, wholesale to his infant capital, the seeds of politeness and civilization, which are now become natives of St. Petersburg.

17th February.—It took such a few hours to read all the English books that could be mustered, that I was obliged again to have recourse to my friend Gil Blas de Santillane, it certainly contains the most faithful picture of Spanish character, and that even without any high colouring. Such adventures as its hero met with I believe daily to take place in Spain, where jealousy and intrigue are the common pursuits of all ranks in society.

18th February.—I went to see a convent about a league from Mello in company with an old gentleman, and had the usual happiness of seeing the nuns through the gratings, etc. In returning I had a good deal of conversation with the old man, and ventured to talk about the cruelty of immuring unfortunate youth in these diabolical cells. I need not say that the practice could not be justified by argument; he however dryly told me that his only daughter, standing in the way of his nephew's inheriting his property, was to go there next year, as he was determined to have a male heir. I do not even conceive that a young woman choosing a voluntary abdication of the world is the more entitled to heavenly favour for making a desperate resolution, generally the result of some temporary delusion, for where is the merit in virtue, if there is no temptation to vice; the heart can sin in the convent with as much freedom as it can in the mazes of the world.

19th February.—Went out coursing and killed a brace of hares.

20th February.—Reports seem to say that the French are withdrawing the troops from the Peninsula. I think the time may come when it will be necessary for them to do so, but do not give the least credit to the present report.

The report was however correct from the cause as specified below—(F.A.W.)

“Owing to the disastrous Russian campaign, and the vast combination now formed against him, Napoleon had organized a new and enormous army, even larger than that employed in the campaign of 1812. But the Emperor wanted old officers

and non-commissioned officers, and experienced soldiers, to give consistency to the young levies with which he was preparing to take the field, and he could only supply this want by drawing from the veterans of the Peninsula; wherefore he resolved to recall the divisions of the young guard, and with it many thousand men and officers of the line most remarkable for courage and conduct. In lieu he sent the reserve at Bayonne into Spain, replacing it with another, which was again to be replaced in May by further levies; and besides this succour, 20,000 conscripts were appropriated for the Peninsula." Napier, Vol. V., pp. 432-3.

21st February.—There is such a complete vacancy and want of employment in our time, that I cannot congratulate myself of a night of having done anything either useful or entertaining.

22nd February.—I received an unlooked-for parcel of clothes from England by a private friend, I do not know whom, and so much the better as it will save me the trouble of returning thanks.

23rd February.—Letters from England. I cannot think it quite kind of my Hampshire friends never communicating with me, they must have made a very unfair presumption that their correspondence is uninteresting.

24th February.—A good enough anecdote of Macdonald. His servants, etc. came back from Lisbon to-day and without a helmet, which he had, unsolicited, written word he had left for me at Coimbra.

25th February.—

Oh day ill-spent that can no action tell!
A blank—for neither good nor evil dwell
Recorded in thy page. The patient knell
That tolls thy flight sounds neither ill or well.

26th February.—I could almost put the same stamp on this "busy day," to save my shame I certainly did go out shooting.

27th February.—Letters from England hinted to Dyneley that Gardiner¹ had been posted to the troop² vacated by Major Foy's pro-

¹ Captain Robert W. Gardiner (Kane's List, No. 979) served at the capture of Minorca in 1798; in the campaigns in Portugal and Spain in 1808, including the battles of Rorica, Vimieira, and the capture of Lisbon; he was Brigade-Major of Artillery in the retreat to Coruña, and with Lord Chatham's expedition to Walcheren, and was present at the capture of Middleburg and Flushing. In 1810, he returned to Spain and served at the defence of Cadiz and the battle of Barrosa. In 1812, he was present at the siege of Badajos, battle of Salamanca, capture of Madrid, and siege of Burgos. In March 1813, he succeeded Captain Macdonald in command of "E" troop, and served with it, attached to the Hussar Brigade, at the battles of Vitoria, the Pyrenees, Orthes, and Toulouse, and other minor affairs. At the conclusion of the war he marched through France with the troop and embarked at Calais for England. In the campaign of 1815, Sir Robert was present with his troop in the retreat from Quatre Bras and at Waterloo. In 1816, he was appointed equerry to Prince Leopold of Saxe-Coburg, and was Aide-de-Camp till his promotion to Major-General in succession to George IV., William IV., and Queen Victoria. For his distinguished services he received the G.C.B. and K.C.H., the gold cross and two clasps, and the silver medal and three clasps for the Peninsula; the Waterloo medal with the Order of St. Anne of Russia for the campaign of 1815. In 1848, he was made Governor of Gibraltar. Sir Robert Gardiner was author of numerous pamphlets, most of which were written in the interest of the Regiment with which to the last he thoroughly identified himself. He strongly advocated the establishment of an "Artillery of the Guard" as exists in other armies in Europe. He died Colonel-Commandant, R.H.A. in 1864.

² "L" Troop, R.H.A.

motion, and that most probably, as Macdonald was stirring heaven and earth to exchange, he would be posted to us. Gardiner being nearly the youngest captain in the regiment, will stick by us a long time, it is therefore an important change in our society. I cannot record the circumstance without mentioning the extraordinary part Macdonald has acted in this business. I certainly never had an idea that Dyneley would lead the troop into the field this year, much less did I conceive that Macdonald, after wishing him hearty success with it, etc., was working all the time secretly to exchange; it certainly would have been much more handsome to declare his sentiments, and I think he could not have done less for the 2nd Captain than have put off his exchanging as long as possible; but he is north of the Tweed.

28th February.—Sir Rowland Hill about this time had his advanced posts at Coria beat up by a plundering party of about 1500 French. The 3rd Regiment beat them back with very little ceremony, these adventures generally indicate retreat.

1st March.—As a proof of the dark unfriendly character of the Portuguese to each other, I have had lately information given me by the Prior of the place, my patron, that several of the inhabitants had forage in their houses, though the strictest search had been previously made. I found it according to his directions, and of course was thankful, but what was the beast's motive for informing me I know not; it could not be friendship, as I never spoke two words to him.

2nd March.—We received letters from Gardiner himself announcing his appointment.¹ The tenour of them proved clearly to me what I have long suspected, that some secret enemies of ours had been undermining the troop in describing it as reduced, unfit for service, etc., and this only with the view of sharing in the spoils if they could succeed in getting it broken up.

3rd March.—This day not even remarkable for idleness.

4th March.—I feel myself so constantly engaged in the daily pursuits of infantry officers in England, viz.: Watching fishes swim under the bridge, throwing stones at pigs, etc. I am ashamed of it, but have nothing else to do.

5th March.—More letters from Gardiner, who, I fear, has a scribbling mania, a complaint, thank heaven, not catching.

¹[COPY.]

SIR,

February 8th, 1812.

There is no part of my official duty more embarrassing than that of selecting officers for the service of the Horse Artillery, a service so generally an object of ambition, and for which there are so many meritorious competitors, but on reference to the course of your service, I had no hesitation in nominating you to the vacant troop of Horse Artillery, in compliance with the request made in your letter of the January 9th from Vizeu, fully persuaded the command could not be placed in better hands.

I am, with sincere esteem, Sir,

To

Your most faithful and obedient servant,

Captain R. Gardiner, R.A.

MULGRAVE.

Captain Gardiner was appointed to "L" troop, *vice* Major N. Foy, promoted January 23rd, 1813, and then exchanged into "E" with Captain Macdonald, invalided, who was re-appointed to it when Sir Robert Gardiner vacated the troop in 1816, on appointment as equerry to Prince Leopold, "L" troop being reduced the same year.—(F.A.W.)

6th March.—Major Frazer and some other wiseacres have recommended the disuse of covers for gun carriages; we find, however, much of our ammunition damaged by the exposure of the boxes to the rain during the wet season on “the retreat” and at San Payo. N.B.—Do not set everything down to be an improvement, because the author of it is esteemed a witch, but draw your own conclusions.

7th March.—Dedicated the day to the sports without much success, however, we do indeed pass our time most stupidly: get up with the sun, inspect a parade, and see no more of the troop, which immediately goes to grass, till 4 o’clock. We then see the horses cleaned, dine at 6, and go to bed immediately afterwards, any reasonable conversation being out of fashion. Indeed, it is one of the evils of an Englishman’s life in Portugal, that he is obliged in the winter to go to bed as soon as it is dark, because he has no fire and it is too cold to sit up, and it is useless to attempt to read with any satisfaction by the nasty dim lamps.

(To be Continued).

THE CASUALTY RETURNS OF THE GERMAN ARTILLERY

AT THE

BATTLES OF COLOMBEY, MARS-LA-TOUR, & GRAVELOTTE.

BY

MAJOR F. G. STONE, R.A.

EVEN as the Devil can quote Scripture, to serve his own ends; so can a less talented individual draw deductions from statistics, which are calculated to deceive the unwary, and lead them to jump too hastily at conclusions.

A few years ago a certain statesman, who was laudably desirous of proving the superiority of our short service army, over its long service predecessor—compared the death-rate which had obtained in our army in India in the preceding year, with that which had obtained twenty years previously: the result was much in favour of the more recent death-rate, and proved (so said the statesman) that our short service soldier was less liable to succumb to the Indian climate than the old soldier of the bygone days. The argument was certainly plausible on the surface, and the statistics were undeniable; but some uncertainty in the infallibility of hasty deductions from statistics, was caused, by an eminent hygienic authority making use of precisely the same figures, a few days later, to prove that “sanitary science and hygiene had advanced so greatly in India, in twenty years, that the death-rate in the army had been considerably reduced, and this, *notwithstanding* the fact that our soldiers were younger, and therefore more prone to disease.”

With this preliminary caution to myself and my readers against drawing hasty conclusions or waxing dogmatic over statistics, let us proceed to examine the casualties and expenditure of ammunition at the battles of Colombey, Mars-la-Tour, and Gravelotte, and see what inferences may reasonably be drawn therefrom for our guidance (*see appendix A.*).

The three battles selected are of special interest for the purpose, inasmuch as they took place in close succession to each other, on the 14th, 16th, and 18th August; they were all offensive actions, commencing with comparatively small forces at Colombey, where only 26 batteries were engaged; developing into the more important battle of Mars-la-Tour in which 37 batteries were engaged, and which probably represents the most severe strain both in fighting and marching of any battle during the war; and culminating in the gigantic contest at Gravelotte on the 18th, when no less than 115 batteries were engaged, and in which the result was so nearly being a success for the French

arms. Of the German batteries engaged, 36 took part in two of the battles, and four in all three.

The battle of Mars-la-Tour was tactically a drawn fight, though strategically the Germans obtained an important advantage: each side retained its ground at the close of the battle, and each side lost about 16,000 men.

In the summary at the end of appendix A. and in all the following tables the casualties to wheels have been computed on the most liberal scale, in order that whatever deductions we may draw as to proportion of spare wheels required, we may err on the side of advocating an excessive rather than an inadequate provision.

It may be urged, with some show of reason, that the casualties to poles and wheels are likely to be greater during an arduous march over difficult country, than on the actual battle-field, where it is notorious that casualties to *matériel* due to shell fire, are insignificant; and that though the figures given here may be a guide for a campaign in Western Europe, where the roads are usually good; they cannot be a trustworthy guide for such campaigns as we are frequently engaged in all over the world.

I do not however hold with this argument, for two reasons:—

- (1) Because in battles like those of Mars-la-Tour and Gravelotte, the rough cross-country work on the field of battle, is an infinitely greater strain than the most trying march along the worst roads; and—
- (2) Because experience has shown that our *matériel* is so excellent, that the roughest marches can be successfully performed, with little or no damage to wheels. As an instance, we may recall the march of 1 Battery R.H.A., 3 Batteries Field, and 2 Batteries Heavy Field Artillery, from the Indus to Kandahar, without the loss of a wheel; this is probably the most severe march that a mixed Artillery force has ever been called upon to undertake.

As stated above, the casualties to wheels have been most liberally computed in the summary and comparative tables, the system which I have adopted being to count every vehicle which has been abandoned, as a loss under the heading of “wheels” equivalent to the number of wheels on the vehicle—thus a wagon is counted as 4 wheels, a limber as 2, etc. Now it is obvious that this system gives us a wide margin of safety; inasmuch, if a vehicle is so damaged that it has to be abandoned, not only is it possible that some of its wheels may still be serviceable, but such wheels would actually become available as spare wheels for other vehicles, which have suffered no other injury than damage to their own wheels.

Before proceeding further we may note that the establishments of the different natures of batteries were as follows:—

	Officers.				Men.		Horses.	
Horse Artillery	4	...	...	150	...	...	207
Light Field Battery	4	...	...	145	...	...	124
Heavy „ „	...	4	...	...	151	...	...	126

[illegible]

SUMMARY:

26 batteries at Colomby	2849	...	...	6	...	...	135	...	159	...	...	gun-carriage, five wheels, including two for gun-carriage, framework of limbers.	gun-carriage, two limbers, 13 wheels, including six for gun-carriage and limbers, six poles, one elevating-screw, four limber-boxes, &c.	two gun-carriages, six limbers, one store-wagon (two more left behind next day), 36 wheels in carriage, four for gun-carriages, 12 for limbers and four for store-wagon two poles, one elevating-screw, three breech-pieces two limber-boxes &c.
37 " Mars-la-Tour	...	19638	...	...	19	...	...	711	...	...	...
115 " Gravelotte	...	...	34483	...	...	20	...	...	913	...	1542			

APPENDIX A.

Army Corps.	Batteries.	Rounds Fired.						Killed and Wounded.						Casualties to Material.					
		Shell.			Case.			Men.			Horses.			Colombey.	Mars-la-Tour.	Gravelotte.			
		Colombey.	Mars-la-Tour.	Gravelotte.	Colombey.	Mars-la-Tour.	Gravelotte.	Colombey.	Mars-la-Tour.	Gravelotte.	Colombey.	Mars-la-Tour.	Gravelotte.						
Guard Corps.	1st heavy field			603					8			21						gun-carriage and breech-piece.	
	2nd " "			704					16			28						wheel, elevating-screw and limber-box, limber.	
	1st light			662					19			22							
	2nd " "			632					24			35							
	3rd heavy			494					6			10							
	4th " "			607					12			26							
	3rd light			727					22			43							
	4th " "			762					7			20							
	5th heavy			590					16			14						limber exploded breech-piece.	
	6th " "			179					11			15							
	5th light			375					22			18							
	6th " "			632					16			15							
	1st horse battery		82	342					3	7		12							
2nd " "			800					21			46						wheel.		
3rd " "			320					3			15								
1st Army Corps.	1st heavy		163					13			12								
	2nd " "		124					18			14								
	1st light		302		6			29			28								
	2nd " "		280					4			11								
	3rd heavy		35					2			6								
	4th " "		75					2			1								
	3rd light		1								1								
	4th " "		1																
	5th heavy		100					4			6								
	6th " "		46					1			2								
	5th light		57					2			1								
	6th " "		315		90			2			2								
	1st horse battery		227		693			3		31		32	wheel, frame work of limber.					breech-piece.	
2nd " "		168					2			6		wheel.							
3rd " "		175					3			11									
2nd Army Corps.	1st heavy field											7							
	2nd " "											1							
	1st light			14								3							
	2nd " "			15								1							
	3rd heavy			6								1							
	4th " "			1															
	5th " "																		
	6th " "			2								1							
	5th light											3							
	6th " "											2							
	1st horse battery											2							
	2nd " "													attached to 10th Army Corps.					
	3rd " "			1								1							
3rd Army Corps.	1st heavy field																		
	2nd " "																		
	1st light											3							
	2nd " "																		
	3rd heavy																		
	4th " "																		
	3rd light											6							
	4th " "																		
	5th heavy											1							
	6th " "											3							
	5th light																		
	6th " "																		
	1st horse battery											53							
2nd " "																			
3rd " "											33								
4th A. C.	1st horse battery		583						21		26					gun-wheel.			
7th Army Corps.	1st heavy field											4							
	2nd " "											3							
	1st light											11							
	2nd " "											18							
	3rd heavy											5						wheel and pole.	
	4th " "											10							
	3rd light											40							
	4th " "											37						two wheels.	
	5th heavy											19							
	6th " "											2						one wheel.	
	5th light											10							
	6th " "											2							
	1st horse battery																		
2nd " "											2								
3rd " "											77						axle-tree box-seat.		
8th Army Corps.	1st heavy field																		
	2nd " "											4							
	1st light											8							
	2nd " "											2							
	3rd heavy											3							
	4th " "											4							
	3rd light											2							
	4th " "											2							
	5th heavy																		
	6th " "											3						wheel.	
	5th light																		
	6th " "											8							
	1st horse battery											8							
2nd " "											29								
3rd " "											14								
9th Army Corps.	1st heavy field											52						two limbers.	
	2nd " "	26	38						1	27	1	70						gun-muzzle indented but remained serviceable, two store-wagons so damaged that they had to be left behind during subsequent advance.	
	1st light																		
	2nd " "											62							
	3rd heavy											45							
	4th " "											52							
	3rd light											49							
	4th " "											47							
	1st horse battery											49						two wheels, a limber and gun-carriage.	
	1st heavy											101							
	2nd " "											10							
	1st light											5							
	2nd " "											15						a wheel.	
3rd " "																			

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The following table shows the maximum loss under the various headings sustained by any individual battery in the three battles; combined with this is shown the average loss per battery under the same heading :—

TABLE I.

Comparative table of maxima and average casualties.

At the battles of—	Officers and men.	Horses.	Rounds fired.	Case.	Gun carriages.	Wheels.	Poles.
Colombey { Maxima	29	28	315	6	1	3	nil
{ average	5	6	109	·23	·04	·19	„
Mars-la-Tour... .. { Maxima	47	78	1148	8	1	4	4
{ average	19	26	531	·5	·027	·35	·16
Gravelotte { Maxima	48	101	965	16	1	6	1
{ average	8	13·4	299	·19	·02	·26	·02
Mean for the three { Maxima	41	69	809	10	1	4·3	1·7
{ average	11	15	313	·31	·029	·27	·06

An analysis of the above table shows that the battle—viz. Mars-la-Tour—which attained the highest average in losses to *personnel* and horses as well as in rounds fired, also arrived at the closest approximation between its average and maxima casualties under these headings, a pretty good indication of the general severity of the Artillery fight as well as of its intensity at a critical point.

The number of case shot expended strikes one as very small, whether we look to the maximum number—16—fired by any one battery throughout the three battles, or at the highest average per battery—·5—attained; when we further note that the next highest expenditure in any one battery was only 8, the conclusion seems irresistible that it is almost a wicked luxury to allow more than 2 case per sub-division as the equipment of a battery.

This question of case is a somewhat serious one, inasmuch as we are fully aware that in order to provide for the exceptional circumstances in which *case* would be required, we are obliged under normal conditions to burden ourselves with a projectile which in all probability we may never use. We are, however, willing to accept this irksome necessity for the simple reason, that if the exceptional circumstances should arise, the fate of the battery will absolutely depend upon the rapid firing of a few rounds of this projectile.

An examination of the conditions under which these battles were fought will, however, show how dangerous it would be to accept these figures as any guide for the number of rounds of *case* to be carried with the battery; in the first place these battles were offensive fights on the part of the Germans, and the occasions upon which a resort to *case* had to be made, consequently rare;

the Turkish Artillery at Plevna, and our own and Italian experience in the Soudan were examples of the expenditure of *case* in defensive fighting which would tell a very different tale. Again the battles under discussion were not merely offensive on the part of the Germans, they were also *successful*: we have unfortunately no statistics of the Artillery fire of the Austrians at Königgrätz, but if we had, they would probably prove instructive, as regards the expenditure of *case* shot by Artillery which is covering the retreat of a beaten army. To sum up, the very factors which make all the other casualties so eminently instructive, tend naturally to diminish the value of the statistics in regard to the expenditure of *case*.

When it is said that these battles were *successful* from the German point of view, it must be borne in mind that they were severely contested, in fact Mars-la-Tour and Gravelotte were both most conspicuous examples of battles in which the only material advantage gained by the Germans was a strategic one; there was certainly no difference in favour of the Germans as regards losses. At Sedan, on the other hand, the German Artillery so completely established its superiority as to render the statistics of that battle of no value, unless it be to prove the advantage of a superiority of Artillery fire, and the possibility under certain conditions of so paralysing the enemy by the action of the Artillery alone, as to force him to throw up the sponge, without coming to close quarters, except at a few tactical points.

There is, however, even another reason for discarding the statistics of *case* fire of the battles under discussion, and this is the absence of anything on the part of the French approaching the furious onslaughts upon the enemy's guns, to which we have become more or less accustomed in dealing with half civilized tribes who refuse to be bound by any laws of tactics or self-preservation.

Thus Hoffbauer, in writing of the German Artillery at Mars-la-Tour, says:—

“The repeated and vigorous attacks made by the enemy with great gallantry and in large masses, were by no means always checked at the longest ranges only, but generally at moderate ranges of between 1200 and 1800 paces. At some points they were not stopped by the cautious and well delivered fire of the line of batteries, until within 800 or 900 paces. The advance of French skirmishers completely covered by the copses of Trouville was arrested by common shell (!) at ranges of from 900 to 1000 paces. All these instances of short ranges occurred at decisive moments, when attention had to be paid to the effect of fire, without regard to cover.”

Again the same author, writing of Gravelotte, says:—

“At ranges of 400 paces the 3rd Heavy Battery of the 9th Regiment repulsed an attack of skirmishers from Champenois, and the 3rd Light Battery an attack from Moscow.”

It is permissible to conjecture that our troops in the Soudan would have been very pleased if they could have secured similar results; but as that pleasure was denied them, and is likely to be denied them again in some of the fierce little wars we so frequently embark upon, it will be wiser to base our estimates on a fair share of close quarter fighting,

instead of relying upon our Artillery fire dispersing infantry attacks before they come within a quarter of a mile of the guns.

As regards casualties to material, it will be instructive to consider the maximum figures in the following form :—

TABLE II.

Material	(1) Maxima in any one battle	(2) Averages for the 3 battles	(3) Totals for the 3 battles
Gun-carriages	{ 1 per 26 batteries at Colombey }	1 per 44·5 batteries	1 per 15 batteries
Wheels	{ 1 per 3 batteries at Mars-la-Tour }	1 per 15 batteries	1 per 5 batteries
Poles	{ 1 per 6 batteries at Mars-la-Tour }	1 per 21 batteries	1 per 7 batteries

A comparison of Tables I. and II. shows that the loss of a gun-carriage disabled is an altogether exceptional circumstance, and that under no circumstance should we anticipate such a casualty occurring twice in the same battery; moreover that the relation which this nature of casualty bears to the total number of batteries engaged, in the action which shows the heaviest proportion under this head, is only 1 to 26 batteries; whereas if we take the average for the three battles the casualty would be only 1 per 44·5 batteries: if now we imagine the same batteries engaged in each of the three battles and consider the casualties as cumulative, we arrive at the loss of 1 gun-carriage per 15 batteries.

Now this last assumption gives, I think, a fair idea of what our greatest possible requirements in the shape of spare gun-carriages can amount to. Appendix B. gives the proportion which are actually to be provided in our service, with the 15-pounder Field and 12-pounder of 6-cwt. H.A. equipments.¹

The same line of reasoning applies to the spare wheels and poles required; but since the figures in column (1) under these two headings show a heavier casualty rate than the figures in column (3), we should adopt the former figures as our basis instead of the latter.

There is one case (*see* Table I.) of a single battery losing 6 wheels, and a comparison with column (1) in Table II. shows that this loss was most abnormal; the case in question was at Gravelotte, and occurred in the 4th Light Field Battery of the 9th Army Corps; this battery had *two* wheels disabled, but it also had a gun-carriage and limber disabled, accounting, as previously explained, for the remaining *four* wheels, which are required to make the total up to *six*.

And now, before jumping to any conclusion, it behoves us to consider carefully the relation which *individual* maximum casualties bear to *average* maximum casualties, and endeavour to arrive at a fair adjust-

¹ Appendix B. has been omitted, as a final decision on certain points affecting it, has not yet been given.—F.G.S.

ment of our requirements therefrom. We have seen that even under the most exceptional circumstances of the same batteries being engaged in three consecutive battles, each of which has been supposed to reach the highest record in casualties under the particular head we are considering—the cumulative loss in gun-carriages would only amount to 1 in 15 batteries: against this take the battle of Gravelotte, in which 2 gun-carriages were disabled in a total of 115 batteries; suppose that these gun-carriages were disabled in two batteries of the same Brigade Division (which was not the case), it is obvious that the fact of no other Brigade Division requiring the spare gun-carriage from its ammunition column, would not be of any immediate benefit to the Brigade Division in which two gun-carriages were disabled; should we be justified then in assuming that each battery should have a spare gun-carriage with its own line of wagons? I think not. The absurdity of adding 115 spare gun-carriages to the column of route, in order that such a case as I have depicted should be met immediately, needs no argument. A proportion of 1 spare gun-carriage per Brigade Division with the ammunition columns is, I think, a most liberal proportion, and may be considered as quite sufficiently near the batteries to meet requirements within reasonable time.

The same line of argument applies with more or less force as regards wheels and poles. It will now be interesting to analyse the average casualties per battery in the Horse and Field Artillery respectively, in order to see whether there are any appreciable differences between the casualties in each branch; to what extent such differences, if any, are repeated in each battle; and to what causes they may be attributed.

TABLE III.

Average casualties per battery of Horse and Field Artillery respectively.

	Shell		Case		Men		Horses		Wheels		Poles		Total number of batteries	
	Horse	Field	Horse	Field	Horse	Field	Horse	Field	Horse	Field	Horse	Field	Horse	Field
At the battles of—														
Colombey ...	127	104	...	·3	2	6	4	7	·33	·015	...	...	6	20
Mars-la-Tour ...	792	460	·75	·45	24	18	43·5	21	·125	·414	...	·2	8	29
Gravelotte ...	310	297	...	·21	12	7	25	12	·19	·31	·05	·01	21	91
Mean for the 3 battles)	410	287	·25	·32	13	10	24	13	·215	·256	·017	·07	...	...

From the foregoing it appears that Horse Artillery may be expected to expend from one-fourth to one-third more ammunition than Field Artillery; probably owing to the fact that the more mobile branch gets earlier on the scene of action in an offensive fight, and consequently has the opportunity of remaining longer in action: it is therefore of even greater importance for the reserve ammunition of the Horse Artillery to be up early in the day than it is for that of the

Field Artillery. An organization of the ammunition columns, which will provide for the distinct and separate supply of Horse and Field Artillery, will become a necessity upon the introduction of a different gun and different ammunition for the two services, and thus the way will be paved for any action which may be necessary on the field for ensuring the earliest possible supply of reserve ammunition to the Horse Artillery. These remarks, as to a separate organization of the reserve ammunition supply, apply only to the Corps Artillery, which is the only "mixed" Artillery unit.

As regards casualties to men and horses, the same law seems to hold in a greater or less degree, and for the same reason. The following table of ratios is illustrative of the proportion of horses to men in the Horse and Field Batteries respectively, and of the average proportionate losses.

TABLE IV.

				Men		Horses	
Proportion of horses to men on the establishment of a battery	{	Horse Battery ...	1	...	1	·84	
		Field Battery ...	1	...	1	·30	
Proportion of casualties as between horses and men, and calculating by averages	{	Horse Battery ...	1	...	1	·38	
		Field Battery ...	1	...	1	·85	

From this it will be seen that the casualties in men and horses respectively, when calculated on the basis of percentage of strength, show relatively a greater loss in men than horses.

The data regarding the expenditure of case shot, point to the fact that its use is of so accidental a nature that no deductions can be drawn as to its being more likely to be used by one branch than the other. Similarly, the casualties to wheels and poles appear to be so rare in occurrence, and of so chance a description, that it is impossible to say that one branch is more likely to suffer than the other in this respect.

I have previously alluded to the fact that four batteries were engaged in all three actions, let us see what proportion the average casualties per battle in each of these batteries bear to the total average casualties of all the batteries.

TABLE V.

		Rounds		Men		Horses		Wheels		Poles	
Average for the four batteries which were engaged in each battle	{	...	231	...	10	...	17	...	·5	...	·08
		...	313	...	11	...	15	...	·27	...	·06

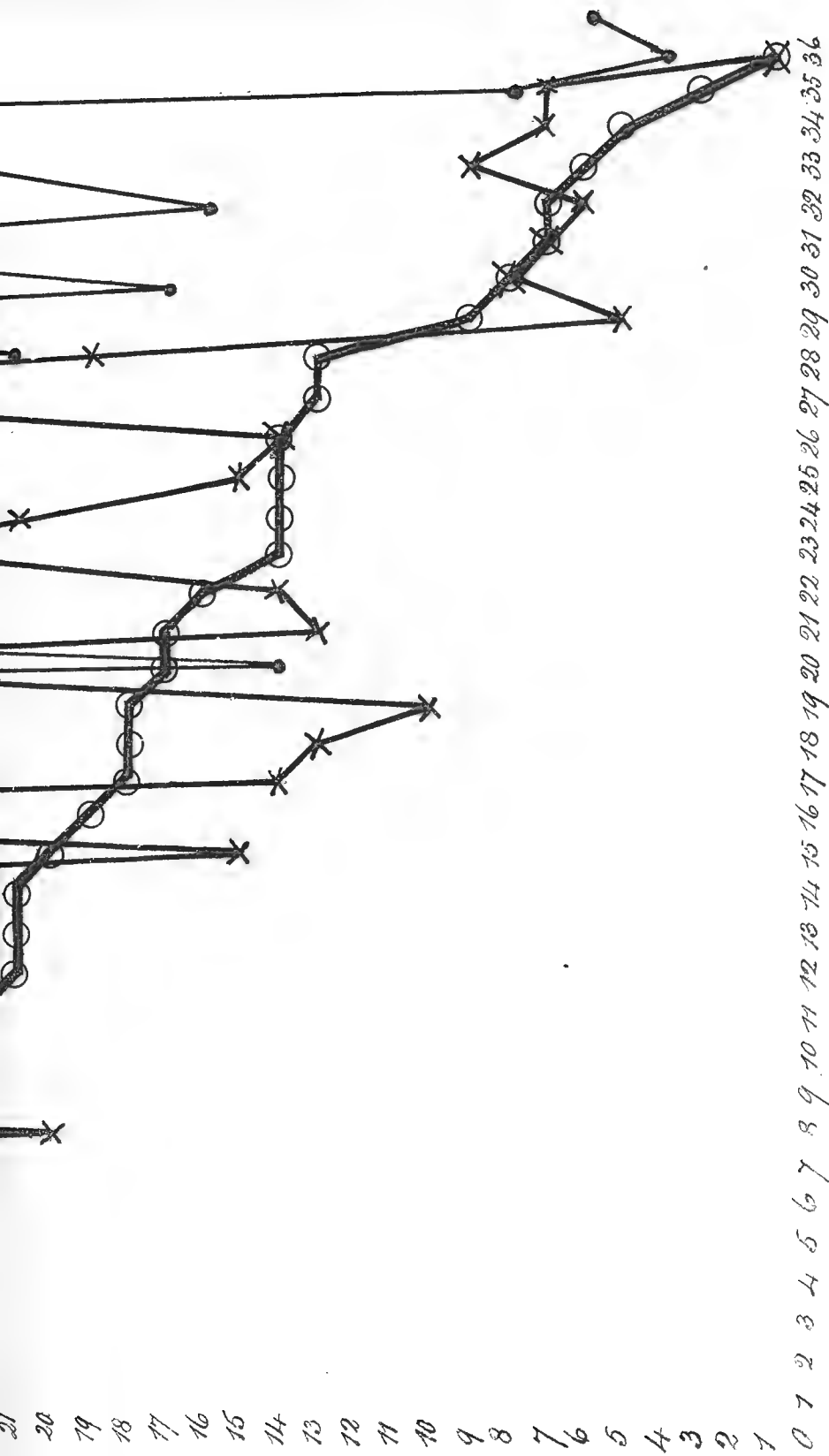
This table, as we might have expected, does not show any special features in regard to the casualties to men and horses in the batteries which were engaged in three successive engagements; the ratio, as regards proportion of horses to men is slightly higher, which is what one might reasonably anticipate, as many horses must have succumbed

from the continuous strain to which they were exposed. The casualties to wheels and poles are also higher; this again one might expect, from the fact that many wheels and poles may have been only partially disabled, or perhaps even only strained, in the first or second battle; and that, owing to the absence of time and opportunity to thoroughly overhaul and refit, the weak points asserted themselves when the strain was continued.

There is one more point of view from which it is interesting to study, the casualties to *personnel* and horses and the number of rounds fired. Appendix C. gives a graphic representation of the figures attained under each of these heads in each battle¹; the batteries are arranged in the order of casualties to *personnel*, the actual figures reached being given by reference to the horizontal line cut by the curve; the casualties to horses and tens of rounds fired will be found for each battery in the same vertical line as the casualties to men, the actual figures, as in the case of *personnel*, being found by reference to the horizontal lines.

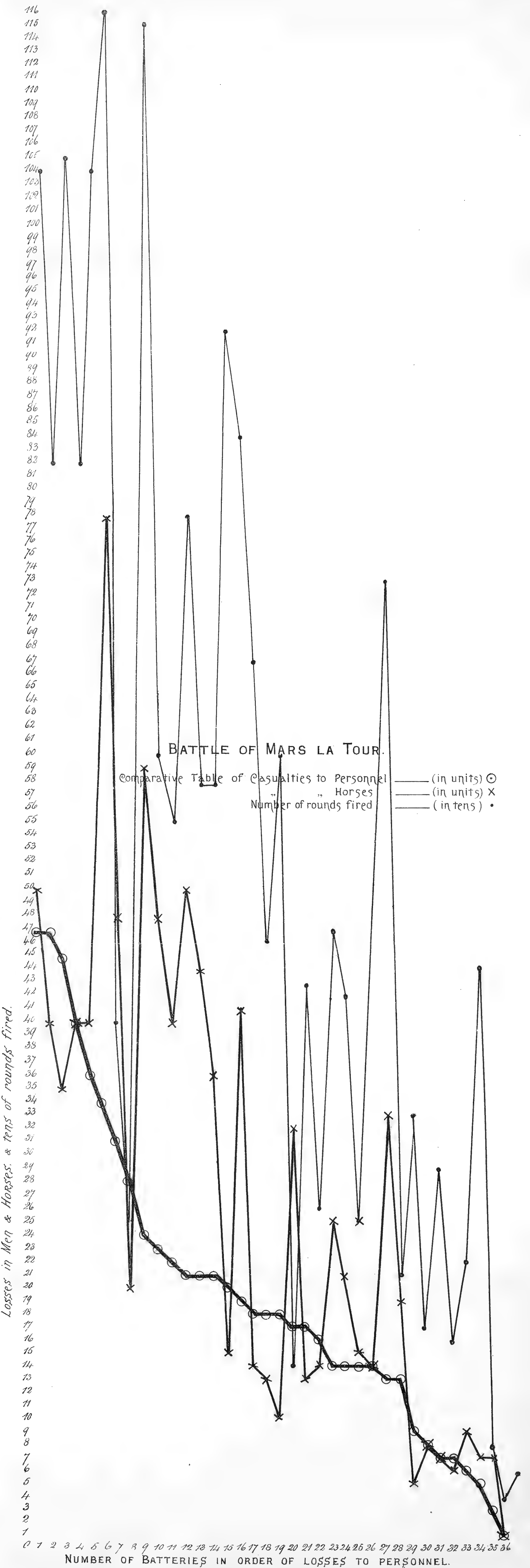
The general result is not precisely what we might expect: it shows that the losses to horses bear a most variable ratio to the losses to *personnel*; while the number of rounds fired does not appear to bear any ratio whatever to the casualties in *personnel* or horses; perhaps we may reasonably infer from the latter fact that the Artillery duel by no means represents the principle part played by Artillery in a modern battle-field, and that the Artillery on both sides may be better engaged than in firing at each other; the cases in which the Artillery duel was necessary, and formed the principle rôle of the batteries, are easily deducible from the diagrams. In such cases it will be observed that the number of rounds fired bears a distinct relation to the number of casualties.

¹ Owing to the expense of printing, it has been thought sufficient to illustrate Mars-la-Tour only.—F.G.S.



NUMBER OF BATTERIES IN ORDER OF LOSSES TO PERSONNEL.

APPENDIX C.





ADJUSTING CLINOMETER PLANES OF ORDNANCE.

A PROPOSAL TO LEVEL GUNS ACROSS TRUNNIONS BY A SPECIAL SPIRIT-LEVEL.

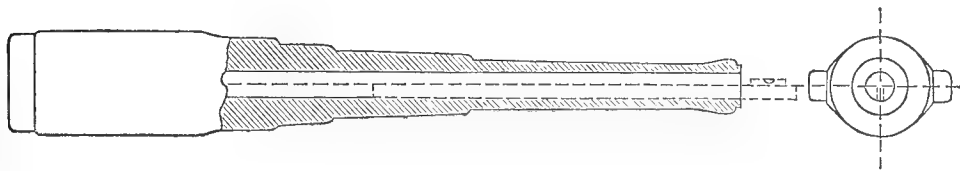
BY

CAPTAIN W. E. DONOHUE, R.A., I.O.M.

THE clinometer plane on a gun should be parallel with the axis of the gun and trunnions.

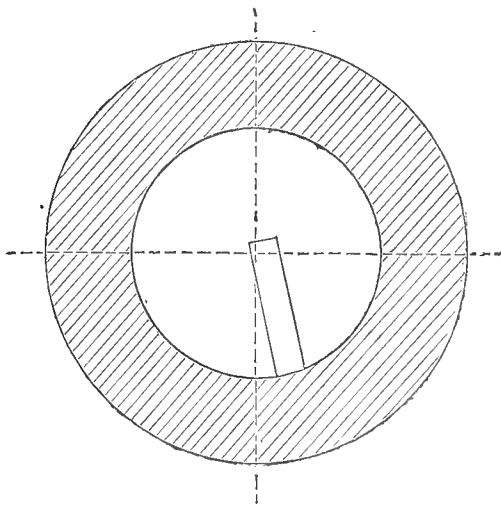
The ordinary method of levelling the gun is to place a long straight-edge in the bore (see Fig. 2) and adjust with an ordinary spirit-level.

FIG. 2.



If great care is taken, a good horizontal position can be obtained by this means; but with a narrow straight-edge there is a danger in the straight-edge being slightly inclined (see Fig. 3), one edge will there-

FIG. 3.



Sketch showing straight-edge in bore out of the vertical.

fore be slightly higher than the other, and should the level get slightly

across the straight-edge (*see* Fig. 4), a small error will be introduced.

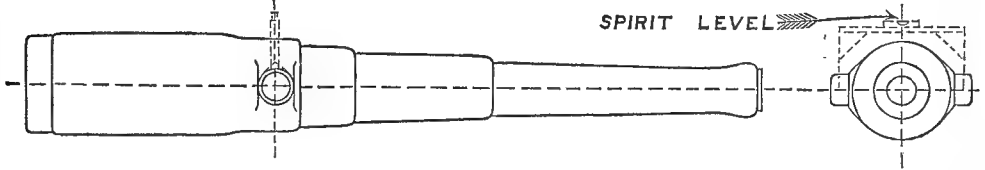
FIG. 4.



Sketch in plan showing the spirit-level laying across the straight-edge.

For levelling the guns across the trunnions, an instrument as shown in Fig. 1 is used. For the larger natures of ordnance, this is a very

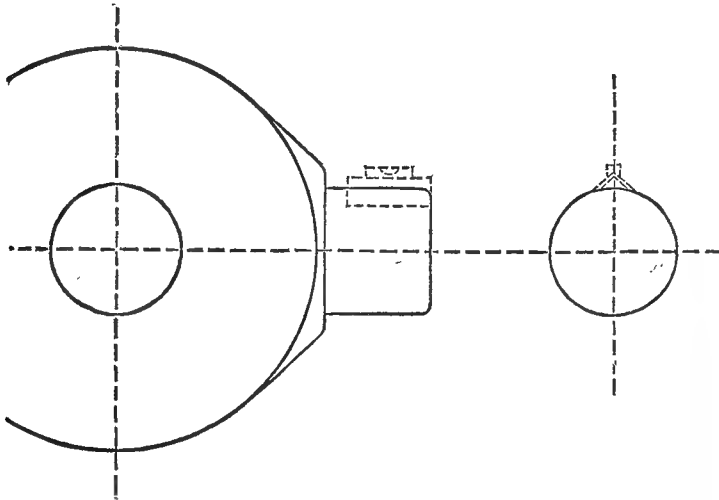
FIG. 1.



inconvenient instrument for carrying about.

The writer, having found it necessary to examine and adjust the clinometer planes of guns in localities and under conditions where it was inconvenient to carry about instruments which would not stand rough usage, constructed a spirit-level with an angle iron base of portable size which enables the gun to be levelled across the trunnions easily; and at the same time, when used for levelling the bore of the gun, eliminates the possibility of error, previously mentioned, caused by the spirit-level getting across the straight-edge, as shown in Fig. 4. The angle iron spirit-level is shown in position on the trunnion of the gun in Fig. 5.

FIG. 5.



Sketch showing angle iron spirit-level on trunnion of gun.

The instrument can be constructed by any Armament Artificer.

It is considered that a spirit-level so constructed would be a very useful instrument for general purposes.

ON THE EMPLOYMENT OF ARTILLERY IN CUBA.

BY

LIEUT.-COLONEL J. C. DALTON, R.A.

THERE is an interesting paper in the Spanish *Memorial de Artillería* for last May, by Lieut.-Colonel D. Gabriel Vidal y Ruby, under the above heading. The author is a talented officer, who for many years was employed as a Professor in the Artillery Cadet Academy at Segovia, and who has, amongst other subjects, written on and studied that of rifled howitzers and mortars for general artillery use.

The heading of this paper is perhaps at first sight somewhat misleading, because it might lead one to believe that it referred to the actual employment of artillery in the campaign which is now being undertaken by Spain in Cuba; and any account based on actual experience of artillery in that campaign would be very acceptable and instructive. This paper, however, as Colonel Vidal is careful to explain, is entirely theoretical. It is the outcome of his study of the subject, and is in fact a treatise on the employment of artillery, according to his views, in a campaign of the peculiar nature of that now being carried on in Cuba. Unfortunately it does not appear from his article what nature of artillery the Spanish Government is employing in the field.

I propose to do little more here than to give a brief outline of his ideas which seem to be sound and practical.

He begins by remarking, what everyone who has read the newspapers must have noticed, that the accounts published by the press are vague and contradictory. One day they will be of an optimist character and the next they will rush off to the other extreme. Colonel Vidal, while fully recognizing the formidable nature of the resistance which the rebels are offering, has no fears as to the ultimate result, and believes that peace and tranquillity will eventually be assured.

It is a well-known rule that when an army has to be equipped and prepared for any definite purpose the following points have, amongst others, to be kept in view, viz.: the nature of the theatre of war, the numbers, valour and qualities of the enemy's troops, the resources and armament which he has at his disposal, his special organization and method of fighting, and to be aware in advance, if possible, of the quality of the military genius of the enemy's leaders. Knowing these points, it is then easy to settle on the composition of the force which is to be sent to oppose the enemy.

Cavalry, infantry and artillery are the elements of every field force, and their relative strength must be regulated by the special circum-

stances of the case. At present we are only concerned with the artillery.

We are all aware that Field Artillery is employed with armies which operate in fairly level country ; that when this country becomes mountainous and abrupt we must adopt a lighter, simpler and more mobile branch of the arm—in other words the Mountain Artillery.

After these and other general considerations the author proceeds to investigate the peculiar conditions of the present Cuban insurrection and the means which, in his opinion, should be adopted to combat them.

The actual theatre of operations in Cuba is, as a rule, mountainous and broken, with great extents of very thick copse and thicket in which grow large trees and an abundance of entangled and climbing plants, and obstinate leafy shoots and branches. The natives of the country call these thickets by the name *manigua*. There are intervals which are free from this jungle, where the ground is more open, and these are called *sábanas*.

According to the papers the number of insurgents amounts to some 5 or 6000 men. Their courage is not to be despised, but their quality from a military point of view would appear to be very defective. The resources at their disposal are probably sufficient with which to commence a campaign, they thoroughly know the ground they fight on and are not likely to fall short of provisions. They have modern weapons for their infantry and cavalry, and for choice they use the *machete* or short broad-bladed sword. They have no artillery.

Their usual system of fighting is by means of surprises, ambushes and *coups de main*. They will not fight unless circumstances appear favourable, and retire in dispersed formation before a superior force. Their organization corresponds with their system of fighting. Up to the present they have but few leaders of prestige, but those they have are well acquainted with the strategy and tactics which they adopt, and they possess the advantage of an excellent system of *espionage* amongst persons who are adherents to their cause but not under arms.

The author then proceeds to consider the question as to what sort of artillery would be best employed in such a country as Cuba and against an enemy as above described.

Field Artillery is of course out of the question, and though at first sight Mountain Artillery may seem to be the most suitable, still when it is borne in mind that the country is mostly covered with thick forest and undergrowth, it is more than probable that Mountain Artillery would in many cases be useless as it could not be properly carried and worked. What seems to be wanted is something more simple, more elementary and more easily manipulated than Mountain Artillery and yet capable of producing sufficient effect. Colonel Vidal reminds his readers that the English constructed in a very short space of time some guns for the Abyssinian campaign which were specially suited for the country they were to be used in, and he goes on to advocate the provision of war rockets for use in Cuba. These projectiles can be thrown at convenient ranges without the aid of ordnance ; they can be carried on a mule's back in suitable boxes over undulating country, and when

this is not possible the boxes can be carried by hand and the rockets can be fired from almost inaccessible positions. It is of course well known that for range and accuracy the rocket cannot compare for a moment with a piece of artillery; but in cases of this kind something must be sacrificed, and more especially so in order to attain simplicity, and above all when, as in the case in point, it is "Hobson's choice." "We must either carry and use rockets" he says "or deprive ourselves of the valuable assistance of artillery and suppress it absolutely."

The transport and manipulation of the war rocket is easy and simple; easy on account of its relatively small weight, and simple because nothing more is wanted than some elementary trestles or tripods for firing at high angles.

The author then enters into a recapitulation of what is known of war rockets which I shall only touch on very briefly. Dating from the end of last century they were known of in India by Colonel Congreve, R.A.; the natives used them, and they consisted then of thick bamboos filled with incendiary compounds. Congreve introduced them into England and greatly improved them, but kept them still as incendiary missiles. The English fired 200 against Boulogne in 1806, and many against Flushing in 1809. Nelson, in 1807, fired 40,000 against Copenhagen in 3 days with great success. The Danish government commissioned Captain Schumacher to study this new weapon with the result that a war rocket was improvised which fired shot and bullets, besides incendiary matter. The Prussians and Swedes began to use them in 1813, in which year Rocket Troops were formed in the English artillery and were employed at Leipzig¹ and Waterloo. Later, rockets were studied by all the principal Powers. France used them in Algeria, the Crimea and Mexico, and even tried them in 1870-1, for the French Minister of War telegraphed on the 19th November, 1870 to the Director of the School of Pyrotechny, "Let me know, by telegraph, if you have any war rockets." Russia has used them in Central Asia, England in Africa and India, and Spain in Morocco in 1859. From that period rockets have gradually been allowed to die out, though England alone still keeps them on both for field and siege operations. None can wish to compare rockets in value with artillery, but in certain places they are undoubtedly of use, and Cuba seems to be one of these. Their fire is somewhat uncertain—this has always been recognised—and hence they should be fired in numbers and at an extensive target. Congreve advocated fire by salvos and Captain Harel, who commanded the rocket batteries before Sebastopol, says in his memoir on the employment of war rockets that "above all and where ever possible they should be fired in great numbers."

The maximum range of the field war rocket is some 2700 to 3000 yards; with the siege pattern the range varies up to some 7000 yards. The minimum angle of projection for the former should not be below 10° and for the latter 25°.

The author next proceeds to describe the war rocket and means of

¹ The valuable services of the Rocket Troop R.H.A. at this decisive battle are a matter of history, Captain Bogue commanding the troop was killed, and Lieutenant Fox-Strangways, who was later on severely wounded at Waterloo and killed at Inkerman, succeeded Captain Bogue in command.

firing it, into which description we need not enter—and more particularly he describes our Hale war rocket. He afterwards studies briefly what type of war rocket would be most suitable to employ against the Cuban insurgents. Direct fire would not be of much use in a country such as that in which the enemy have taken refuge, hence indirect fire is necessary. He does not think a shrapnel would be of any use, and recommends an explosive shell loaded with granular gun-cotton which would ensure the shell bursting into a large number of fragments. Time fuzes should be used to guard against premature explosions owing to unforeseen shocks which would be liable to take place with the percussion fuze. If it were found difficult to invent a time fuze which would ignite the gun-cotton powder then it might be necessary to substitute ordinary gunpowder for the latter. The incendiary rocket would not appear to be of much use for Cuba, because it is impossible to destroy by means of it the virgin forest and exuberant vegetation, though rockets might come in usefully on certain occasions.

As regards the construction of the rocket, Colonel Vidal recommends the Hale system of rotation, or the French pattern with central tail-piece. It should be fired by a percussion tube. The tripod should be of the English pattern. The calibre of the rocket should be 7^{cm} (2·75") and the shell of 8^{cm} (3·15") which would give a total weight of some 8·8 lbs. as a maximum. The length would be about 19" without the tail-piece, and with it about 39", and it is calculated that one mule could carry two boxes of 12 rockets each. The boxes should be adapted for mule or hand transport.

The author then proposes the following establishment for a rocket battery, viz.:—

- 1 Captain.
- 2 Lieutenants.
- 3 Sergeants in charge of two tripods each.
- 6 Corporals, layers, one per tripod.
- 6 Gunners as assistants to above.
- 12 Gunners to supply the rockets.
- 22 Mule drivers.
- 1 Master Artificer.
- 1 Assistant to ditto.
- 1 Shoeing-Smith.
- 1 Assistant ditto.
- 1 Collar-Maker.
- 1 Assistant ditto.
- 2 Artificers (a carpenter and a blacksmith).
- 20 Gunners in reserve (with shovels and picks).

The men to be armed with carbine and sword-bayonet (*machete*).

To each tripod there would be one layer, one assistant, and two men to supply ammunition (*proveedores*).

On the tripods being placed in position each assistant layer would equip himself with a pocket containing a lanyard, a pouch with friction tubes, a knife and a level. A weather-cock on a pole should be placed

in a convenient position so that the direction of the wind may be known. Fire should be by salvos.

Rockets could be employed against masses of infantry in the open, against the insurgents when lightly entrenched, using in this case high angle fire and, finally, they would have (as has been observed on many previous occasions) a good moral and material effect against cavalry.

The author fully recognizes the difficulties which present themselves with regard to the adoption and employment of war rockets in the Cuba campaign, viz.:—

- (1.) The campaign is now actually in operation.
- (2.) Not being able to provide at short notice either the rockets or all the necessary material for their service.
- (3.) Having to improvise the manufacture.
- (4.) The need to experiment with them and draw up fire-tables.
- (5.) To train the *personnel* in the manipulation of the rockets.

The difficulties are no doubt great, but if it is not wished to manufacture rockets in Spain they might be bought in England.

The author then considers how they could proceed to manufacture them in Spain and does not apprehend any difficulty in training the *personnel*. But, he goes on to say, let us suppose that the Spanish government actually decline to consider the question of rockets for the Cuba war; there still remains the question whether the Spanish troops in Cuba ought not to have the advantage of the great moral and material support which artillery supplies, and he therefore propounds a second suggestion, viz. : to employ light batteries of the 9^{cm} (3·5") field mortar. They would be more mobile than mountain batteries; their high angle fire would be most efficacious against the enemy under cover of the thicket (*manigua*), and they could fire common and shrapnel shell both with time fuzes. It is necessary to discard the percussion fuze in order to avoid the premature bursts of shell owing to impact with intervening trees, branches, &c. The following are the relative weights of the 9^{cm} mortar and 8^{cm} Plasencia mountain gun:—

	9 ^{cm} Mortar.	8 ^{cm} Plasencia.
Weight of piece... ..	178·8 lbs.	225·1 lbs.
„ carriage with wheels ...	196·4 „	357·5 „
Total weight of system	375·2 „	582·6 „

With an angle of elevation of 45° and a charge of about 13 ozs. we obtain with the 9^{cm} mortar a range of 3094 yards.

With the first line of ammunition there would be 48 common and 24 shrapnel shell, with 72 charges of various weights (from 7 oz. to $\frac{3}{4}$ oz.) and 80 tubes.

The advantage of the mortar over the gun consists in being able to carry the former on its bed by hand, which cannot be done in the case of the gun. Three men are sufficient for this work. In general all the material for the 9^{cm} mortar would be carried on mule back, but when the country presents difficulties it can be carried by hand.

Finally this mortar would be of great use to assist mountain guns when the enemy gives battle from an entrenched position or from behind a stockade, &c. Moreover this was done in the previous war with the 8^{cm} S.B. Coehorn mortar.

The author concludes with the following summing up:—

- (1.) Mountain artillery could accompany the troops destined to operate in mountainous and broken ground, which is fairly open.
- (2.) When the enemy fights entrenched or behind stockades and natural cover the 9^{cm} mortar might be used for indirect fire as an auxiliary to the gun.
- (3.) The above-named mortar, firing at high angles, could also be used to expel the enemy from the dense cover of the thickets, and in case of guns being unable from the nature of the ground, exuberance of vegetation, &c. to be of service, mortars could take their place.
- (4.) If the nature of the ground be considered so bad that artillery is deemed useless, and if at the same time it is thought that war rockets would be valuable, then these might be adopted and fired at high angles to search the cover under which the enemy is taking refuge.
- (5.) The war rockets would also be useful in the open in cases when, for various reasons, the artillery cannot be got up. The rockets would be fired at low angles to skim along the ground and would be specially valuable against cavalry.

In another paper on the same subject in the *Memorial* for August 1895, Lieut.-Colonel Gabriel Vidal makes further suggestions which are briefly as follows:—

- (1.) He has noticed in the reports of the war that the rebels are in the habit of attacking isolated posts which are garrisoned by small bodies of loyal troops, and in the event of not being able to take these posts by assault, they attempt to starve or burn out the defenders.

As a rule the defenders are only armed with small-arms, and though doubtless the breech-loader or, still better, the repeating rifle is the first necessity, nevertheless, in the absence of quick-firing or machine guns, the author is of opinion that hand-grenades should be supplied to all these small works and that the soldiers should be instructed in their manipulation for use at close quarters. He therefore proceeds to describe the hand-grenade as used in the French army, which weighs 1 kilogramme (2·2 lbs.) and which is ignited by means of a fuze fitted with a friction tube. He recommends as an improvement on the French

system that the fuze should be screwed into the shell instead of being pressed in, and that the hand-grenade should be projected either by hand or by means of tubes or troughs. The bursting charge should be $3\frac{1}{2}$ oz. of R.F.G. powder. Every small detached work or post should be furnished with a supply of these missiles.

- (2.) It being a recognised axiom of war that troops destined for the attack should march by different roads and combine for joint action, it is necessary that the various columns should be in perfect communication with each other. For this object the telegraph, telephone, and signalling either by sound or vision are the surest means to employ. In Cuba, however, the conditions are such that visual signalling is probably the only means at the disposal of the troops for keeping up communication. He then describes the American "Very" pistol and signal rockets. The former is adopted at the present time in the United States army and navy and in the Italian army,¹ and is a breech-loading central-fire pistol. The pistol discharges red and green stars, and by means of combining the two colours and adopting longer or shorter series of lights a code of signals is readily formed for use at night. The Italians also use smoke rockets for use during the day. The signals with these depends on the degree of the intensity of the smoke, and the rockets also emit a considerable sound by means of a petard which they enclose.

Colonel Vidal recommends, therefore, that each work of defence should be furnished with a proportion of signal rockets for use during the daytime; and for use at night he recommends for each defended post a "Very" pistol with a supply of cartridges.

Similarly all the operating columns should be furnished with "Very" pistols and signal rockets for night and day use in conjunction with the forts or other works of defence. In all these works also there should be a supply of torches and light-balls for aiding the defence if attacked at night.

- (3.) In certain special cases the author advocates the use of trains armed with field guns as was done by the English in the Egyptian campaign. To support this proposal he quotes an incident of the campaign in Cuba, when in June last a Spanish officer in command of a detachment embarked 250 men in a train and started down the line to attack a force of the enemy which was reported as being in the vicinity of a factory not far off. The insurgents, 800 strong, were conveniently drawn up in a semicircular formation to receive the train, and while disembarking the men some considerable losses were caused. Once

¹ Also in the British Royal Navy I believe.

the troops were disembarked and got into attack formation they repulsed the enemy, but Colonel Vidal maintains that if there had been a field-piece on the train to cover the disembarkation the loss alluded to might have been saved, the principal loss to the attackers being at the moment of alighting from the train.

Colonel Vidal concludes his paper by saying that he is of course aware that he has put forward nothing new, but he ventures to think that the simple auxiliaries he has advocated might be of great use on the principle that "small causes may produce great results."

EXTRACTS FROM OLD ORDER BOOKS, R.A., SHEERNESS.

COMMUNICATED BY

CAPTAIN W. H. CUMMINGS, R.A.

THE enclosed are transcriptions from one of two old Order Books discovered by Captain W. H. M. Duthie, R.A. in the R.A. District Office, Sheerness, in 1878, who designed and presented to the Officers Mess a casket to contain them under lock and key, and also the bound M.SS. with a transcript which can be taken out for general perusal, thereby ensuring the preservation from destruction and safe custody of these valuable and authentic curiosities of an epoch just 100 years old. I venture to think that the perusal of these orders will prove as interesting to the readers at large of the R.A.I. "Proceedings," as to the officers stationed at Sheerness.

SHEERNESS, *11th August 1795.*

It having been represented to His Royal Highness Field Marshall The Duke of York, that allowing the exchange to take place between Lieutenants Wilson and Wyville would be contrary to the uniform practice of the Army: His Royal Highness has therefore for the present suspended the said appointments.

SHEERNESS, *8th September 1795.*

Joseph Martin Royal Artillery now confined for giving ill language to Sergeant Baxter of the same Corps and refusing to go Prisoner when ordered, is therefore by order of the Lieut.-Governor debarred port liberty for a month from this date and in that time to mount Four Extra Guards. His name is to be put up at the Gate and Sally Port accordingly—should Martin persevere in such turbulent un-military behaviour the Lieut.-Governor is determined to bring him to a Garrison Court Martial.

SHEERNESS, *21st October 1795.*

Lieutenant Roskrow¹ Royal Reg^t Art^y to direct the Master Gunner or anyone else of his command to make out the Muster Rolls for the Garrison Staff and Artillery. These plain and easy made-out Rolls, were formerly done by the Master Gunner; but the total debility both body and mind of the late Master Gunner rendered him unfit for that, or anything else.

SHEERNESS, *24th October 1795.*

Divine Service to-morrow the men are to be very clean.

¹ Kane's List, No. 669.

SHEERNESS, 28th October 1795.

All sentinels posted within the Garrison as well as without, and all out-guards are to Receive Major Booth, the Chief Engineer of this Fortress, with rested arms.

SHEERNESS, 30th October 1795.

The Commanding Officer on coming from Blue-Town last night between the hours of 12 and 1 o'clock was not challenged by the sentinel at the Main-Gate, nor was the Single Horse Chaise with a Stranger stopped and properly examined before Admitted into the Garrison. He desires that the like irregularity may not happen again for the future.

SHEERNESS, 2nd November 1795.

The Royal Artillery and Royal Invalids off duty to parade to-morrow noon; the latter with arms; the working men excepted, who may fall in in their Labouring Dresses, when the Sentence of the Garrison Court Martial Held this day to be carried into execution, under direction of the officer on duty.

The Surgeon to attend and the Drummers with their Cats.

SHEERNESS, 5th November 1795.

As the Admiral is fortunately recovered from his late indisposition and gone hence at present; the Garrison Drummers are therefore to Beat round the Parade as formerly.

SHEERNESS, 10th November 1795.

Yesterday afternoon about half an hour past One, the Lieut.-Governor found Richard Edwards, Private of Captain Figg's¹ Company, fast asleep when Sentry, at the Salient angle of the Minster Bastion; lying with his Thighs and Legs stretched out from the Sentry Box.

Such a flagrant, and highly hazardous breach of duty, should come before a Garrison, nay even a General Court Martial. The Lieut.-Governor is however willing to show lenity; therefore only debars Edwards Port liberty for six weeks from this date; and during that time to mount an Extra Guard Weekly. He is also denied the privilege of working.

SHEERNESS, 20th November 1795.

The Lieut.-Governor repeats his orders of the 12th November 1788.

The Non Commissioned Officers to see that the Barrackrooms, stairs and Passages are kept clean. * * * To prevent the women from ironing Linen on the Barrack Blankets; or using the Sheets, as Bed, or Window Curtains. * * *

The Non Commissioned Officers and Privates of the Invalids in this Garrison, having often complained of the number of Seamen and Marines that are in the Winter Season permitted to Lie all night in the Guard House. The Lieut.-Governor therefore in common justice to his command is necessarily obliged to refuse such men being so admitted in future; as the soldiers on duty have thereby greatly suffered.

¹ Independent Companies of Invalids.

SHEERNESS, *21st November 1795.*

Lest the Muster Master should come down to-morrow morning by water; the Garrison to be ready to fall in at Eleven o'clock—need not add in their usual soldier-like manner. The whole to parade without Powder in their hair.

SHEERNESS, *23rd November 1795.*

The Garrison to be ready to parade for the Muster this morning at eleven o'clock.

The strictest sobriety is expected.

SHEERNESS, *27th November 1795.*

As the new formed company of Invalids commanded by Major Forch,¹ have behaved in a very unmilitary and irregular manner, *on and off* duty. The Lieut-Governor therefore assures them of his determined resolution to support due order, and subordination in this Garrison and gives this fair warning, that should they persevere, they shall be punished agreeable to the rules of War. The Masters of Canteens in this Fortress to be warned not to trust them.

SHEERNESS, *14th December 1795.*

The Sergeant of the Main Guard to be correct in reporting the names of Strangers who come into this Fortress. Yesterday morning Lord Hill and Colonel Blake of the Guards were reported, instead of the Earl of Errol and Lieut.-Colonel Black of the 32nd Light Dragoons.

SHEERNESS, *8th January 1796.*

The Surgeon having reported Joseph Rotheray of Captain Malcolm's² Company fit for duty; and the Commanding Officer has for some time past been convinced that Rotheray shammed sick to evade duty: therefore orders he may in future be strictly watched, being a skulking soldier.

SHEERNESS, *17th January 1796.*

Complaint having been made to the Commanding Officer that a number of Idle Boys daily assemble on the Grand Parade; and in their various Gambols, break windows, spoil the parade with their stilts, and make an Hideous noise. The Non Commissioned Officers and Privates of the Roy¹ Art^y and Roy¹ Ind^t Inv^{ds} are to prevent their children from making such disturbances in future.

SHEERNESS, *19th January 1796.*

The Sergeant who superintends the serving of Water is to take care that it does not run over the parade as it has of late, which is wasting that very necessary article; and making a disagreeable Puddle.

SHEERNESS, *5th February 1796.*

The Lieut.-Governor shall not give the Garrison any further trouble about that fraudulent, pitiful, pilfering scoundrel, Daniel McGane. Therefore remits the remainder of his corporal punishment; and

¹ Independent Companies of Invalids.

² Independent Companies of Invalids.

orders him to be Drummed out to-day noon; with a Label on his breast expressive of his crime.

The Lieut.-Governor flatters himself, there is not another Soldier in this Garrison tainted with similar dishonest principles; but should there be, he is determined to weed out all such miscreants.

SHEERNESS, *15th February 1796.*

As our avowed and inveterate Enemies the French and Dutch have now a considerable force at the Texel, ready to put to sea; if not already out, this Garrison should therefore be particularly watchful and alert; ready at all times to repel any Attacks that may eventually be made against this very Consequential Fortress.

As our chief defence depends on the Artillery being well served; the Lieut.-Governor therefore orders the Cannon Practice to be recommenced under direction of Lieutenant Roskrow Roy^l Art^y. Major Forch's Company being lately formed, and mostly consisting of Raw undisciplined men, are to be carefully attended to, in that necessary point of duty. Such men of Captains Malcolm and Figg's companies who have lately joined are likewise to be trained in the Artillery Practice.

SHEERNESS, *19th February 1796.*

On any appearance of an attack against this Fortress, Major Forch's company is to take post in the Half Moon Battery; Captain Malcolm's on Craig's Battery and Captain Figg's on the Saluting Battery and Minster Bastion.

The small Detachment of Royal Artillery to be posted at the Guard House Battery and from thence distributed as the nature of the service may require.

The men on their respective posts to draw up in rear of the guns.

Should the enemy point to a land Attack, the order and the disposition of the defence shall be arranged accordingly.

SHEERNESS, *29th February 1796.*

The Artillery Practice to be continued every Sunday morning till farther orders.

SHEERNESS, *8th March 1796.*

To-morrow being the day appointed for a General Fast: the Garrison to parade for Divine Service at the usual hour.

SHEERNESS, *10th March 1796.*

The cruel and unprovoked treatment the Russian Marines met with at the Tuns Canteen last Sunday induces the Lieut.-Governor to acquaint the Masters of Canteens in this Fortress, that they are responsible for the bad behaviour of their servants. And should such miscreants in future dare to knock people down (as last Sunday) either in the house or streets; the Master and servants of such canteen, shall be immediately turned out.

When a Party of the Main Guard is called to quell any disturbance within the works, the Soldiers are to conduct the rioters out of the Fortress; but not to suffer them to be beaten, as lately. Should any

of the Russian Seamen or Marines disturb this Garrison, the Guard is to beckon them out of the Canteen or Fortress.

SHEERNESS, *2nd April 1796.*

In spite of the Lieutenant-Governor's repeated orders that the Corporals shall go regularly round with the relief in posting the sentries; he notwithstanding finds that they often send one man to relieve another. Should any Corporal on duty dare to do so in future, he shall be tried for disobedience of orders.

Before the Guards march off the Parade, the officer on duty is to pitch upon a proper man to act as Corporal, which man then becomes responsible in that line.

SHEERNESS, *26th May 1796.*

The Lieutenant-Governor expects that the women who are indulged to live in the Barracks with their husbands, will behave with decency, and regularity; if otherwise, they shall be turned out, as Duncan's and Rothery's wives are.

SHEERNESS, *30th June 1796.*

As the Lieutenant-Governor's repeated orders against Drunkenness when men are warned for or on duty seem of late totally forgotten.

He therefore once more gives them fair warning of his determined resolution to crush that truly unmilitary, and hazardous crime, by exemplary punishment, agreeable to the Rules of War. Is at the same time convinced that drunkenness and most irregularities proceed from remissness in the non-commissioned officers; who too often sink their rank, by making companions of the men; thence, weaken their command, and connive at crimes. Hopes without further admonitions the non-commissioned officers and Privates, will strictly attend to their respective duties.

SHEERNESS, *24th July 1796.*

Ralph Bishop, Private of Captain Figg's Company, For disobeying the Lieutenant-Governor's order.

By cohabiting in the Barracks with a woman without being married: and when detected, went and got married; without leave, or even knowledge of the commanding officer of the company.

Ralph Bishop is therefore by order of the commanding officer, confined to this Fortress for a month, from to-morrow, and for that time to mount an extra Guard weekly. His name to be put up at the Gate and Sally Port accordingly.

SHEERNESS, *27th August 1796.*

As the utmost alacrity and attention, become more necessary than ever in this Garrison, the officer on duty is to take care that the Main, Artillery, and Line Guards are fully and clearly instructed, in the Signals of Alarm from the Sandwich Flag Ship at the Nore. In particular the sentries, on Craig's Battery, the Cavalier, and Minster Bastion.

The Relief and Patrole, in going round, are likewise to have an eye to the Nore.



BALAKLAVA.

(A RECOLLECTION).



IN a lecture on the Co-operation of Horse Artillery and Cavalry, delivered at the Royal Artillery Institution on the 7th of March and appearing in the April number of the "Proceedings," an account—open in several respects to considerable criticism—is given of the doings of "C" Troop at the battle of Balaklava. Of "I" Troop, commanded by Captain Maude, the only troop which was seriously engaged or took any important part in the action, not one single syllable is said. Apparently, the lecturer seems to have overlooked the fact that, beyond "C" Troop, there was any Horse Artillery in the field.

It is with the object of rescuing from oblivion the deeds of a most gallant troop that this recollection of the 25th October, 1854, is here given.

"I" TROOP (NOW "D.")

The sky, and the rocky summits of the hills which encircle on all sides the plain of Balaklava were beginning to redden with the first faint glimmer of day; the hillsides, and the whole plain at their feet, lay wrapped in a dense autumn mist; it was half-past six o'clock. For an hour past the Cavalry Division had been on parade, as usual, in front of its camp near the village of Kadikoi and was impatiently awaiting the order to return to its lines and to breakfast, when the sound of guns amongst the hills around Kamara startled it from its apathy and aroused speculation as to whether there was to be a repetition of the exciting skirmish which had taken place a few days previously. But the increasing fire, and its development in other directions, the rapid circling to either hand of the vedettes posted along the crest of the Causeway Heights, with the occasional passage along it of horsemen at a gallop betokened that there was something more than usual astir in the morning air. And soon, spurring out of the darkness, came an aide-de-camp with orders for the Division to mount and advance. Threading its way through a vineyard which at first impeded its progress and accompanied by the Heavy Brigade "I" Troop pressed forward towards a point a little to the right of where No. 3 Redoubt crowned the Causeway, and breasting the slope at a gallop suddenly emerged into the clear daylight and sprang swiftly into action. But the level rays of the rising sun, now well above the horizon, smiting directly in the faces of the detachments dis-

turbed and bewildered their vision and it was in vain that they sought around for some tangible enemy. The repeated flashes, however, which darted continuously out of the dense mist that hung on the hill-sides revealed the presence of a long line of guns ranged, seemingly, between Mount Hasfort and the Fedioukine Heights and whose fire appeared to be directed principally against No. 3 Redoubt. The rapid cannonade now opened by the troop against this line of flashes, for the guns were completely invisible, soon attracted the attention of the Russian gunners and they began quickly to pick up the range. Standing out boldly on the skyline the 6-pounders of "I" Troop presented an admirable target.

The enemy's fire became hot. The detachment horses were withdrawn behind the reverse slope of the Causeway (where the Greys were drawn up); but for the limbers there was no shelter from the merciless rain of shot and shell under which the horses were falling (in No. 6 gun alone five were struck down); several spokes too were knocked out of the limber wheels. The men around the guns seemed to bear charmed lives, for though the gun carriages were scored and injured by the shell which burst around them and this was especially the case in the left half troop, yet the round shot passed harmlessly over or between the sub-divisions, and at this period there were no casualties of any consequence amongst the gunners though there were some remarkably narrow escapes.

The troop might have been in action some fifteen or twenty minutes when Captain Maude, whilst calling attention to the advance of some grey-coated infantry skirmishers through the brushwood that lay in front of and below the troop and directing the howitzers to open on them with shrapnel, had his horse killed by a shell which bursting at the moment of impact brought that fine soldier to the ground desperately maimed in the arm and leg besides inflicting a wound in his face.

A tourniquet which he fortunately had in his holsters was placed on his arm, the artery of which was lacerated; and four men conveyed him on a limber blanket to the rear where his wounds were properly attended to, but for some days his recovery was doubtful.

The command of the troop now devolved on Lieutenant Dashwood the senior of the two subalterns present. He at once mounted his horse but it was soon killed by a round shot. Barely was he in the saddle of a second when that too was shot.

It was at this juncture that Lord Lucan appeared on the scene. Finding how completely the troop was overpowered by a superior artillery—superior numerically and in weight of metal—that its front was now assailed by infantry, that nearly every round in its limbers had been expended in maintaining this useless and unequal combat, and seeing dead on the field a third of its magnificent gun horses he gave orders for it to limber up and withdraw to the lower plain. As it retired a round shot dashed Gunner McBride of No. 4 Sub-division dead out of the saddle and slew the two centre horses of No. 4 gun.

* * * * *

When the troop came into action the Heavy Brigade, which had accompanied it to the foot of the Causeway, detached the Scots Greys

as a support and moving away to its right was occupied for a time in protecting the retreat of the Turks then streaming in disorderly rout from the Redoubt (No. 1) on Canrobert's Hill, which had about that time been captured; and afterwards in checking the advance of a body of the enemy which threatened to issue from the gorge betwixt that hill and Kamara; but beginning to feel the fire opened on it by some Russian batteries which had been pushed forward it received orders to retire towards its camp. It was at this moment that "I" Troop and the Greys coming down from the position which they had been occupying were directed to form a line and cover the retirement. This movement was executed with great steadiness, the Greys falling back by alternate squadrons and the guns by half-troops, though the former had some horses killed or disabled by the fire from Canrobert's Hill and its vicinity. As this line passed the village of Kadikoi the Troop (which was on the right) was met by Captain Shakespear, with the waggons, who halted it, replenished the exhausted limbers, and took over the command. He had gone with the waggon horses, as usual, early in the morning to Balaklava to assist in the transport of siege *matériel* to the front, but anxious at the continuous firing he returned to camp and brought the waggons into the field. The limbers having been filled up and various casualties made good the guns moved off to rejoin the Cavalry Division, which was found drawn up not far from No. 4 Redoubt and close under the precipitous steeps of the plateau of Sevastopol. Soon after, the Heavy Brigade filed off in the direction of Kadikoi and "I" Troop was left with the Light Brigade under the command of Lord Cardigan.

The ground in the vicinity of No. 4 Redoubt is very irregular, being broken up by numerous small hillocks, so that the view from the spot occupied by the Light Brigade was confined and obstructed; and to this cause also it is probably due that the Officer in Command of the Brigade was so completely unaware of certain important events that were transpiring close at hand. By some means or other it at last came to his knowledge that only a few hundred yards away a dense column of the enemy's cavalry was in motion to his left front and beginning to pass over the Causeway Heights from the outer to the inner plain. "I" Troop was immediately pushed forward a short distance and brought into action, but was not permitted to advance sufficiently to the front to obtain an uninterrupted view of the enemy. It however succeeded in putting a few shot into the column as it pressed forward, so soon to meet defeat at the hands of Scarlett's gallant horsemen.

Kinglake alludes incidentally to "I" Troop firing into the column, but he makes a mistake, not an unpardonable one considering the rapid passage of events, in his supposition as to the time when this occurred. He says it was as the column was retreating whereas, as we have seen, it was during its advance.

The passage is as follows:—

"The troop of Horse Artillery which accompanied the Light Brigade had by this time some pieces in battery which discharged a few shots at the retreating horsemen."¹

¹ Kinglake, Vol. IV., p. 202.

After the retreat of the Russian Cavalry there was a considerable lull in the battle, during which the Light Brigade moved into the Outer Plain and finally formed across it in two lines, "I" Troop being posted on the right of the leading one. The Heavy Brigade lay to the right rear of the "Lights" and had to its right front No. 4 Redoubt. Whilst awaiting in this position the arrival of infantry from the front Captain Nolan arrived on the field bringing from Lord Raglan the order the intention of which has provoked so much discussion. Its closing words were "Troop of Horse Artillery may accompany." This order was not communicated to Captain Shakespear till the Light Brigade was already in motion and slipping away to the front at ever increasing speed. Though uninformed as to what he was expected to do, an inherent spirit of obedience at once prompted execution of the order. But it becoming momentarily more and more apparent as the troop trotted steadily forward that before it could render any efficient service the fire which it was encountering would in all probability entirely cripple it, the word was given to go about and it retired to a position not far from the Heavy Brigade. This judicious decision of Captain Shakespear was rewarded by the subsequent commendation of the General Commanding Royal Artillery in the Crimea.

It is difficult to form any idea of the precise hour at which the different events of the day took place. The several breathless scenes seemed to the participators in them to have occupied a time proportionate to the magnitude of their importance and when the action came to an end the day seemed verging to its close and yet in reality it was but a little past noon. From this hour till nightfall the troops remained in the proximity of the northern end of the Causeway, when fires having been lighted so as to mislead the enemy as to its occupation during the night, the whole force retired to the neighbourhood of Kadikoi. The troop reached its camp to find that during the day it had been plundered by the lustful soldiery of Turkey; all eatables had disappeared but the Moslem spared the fluids forbidden by Allah. Of drink there was enough and to spare, both for officers and men, but a hungry day was succeeded by a hungry and restless night.

F.T.W.

A FEW HINTS ON MARCHING AT HOME AND ABROAD.

BY
MAJOR J. HOTHAM, R.H.A.

INTRODUCTION.

NEARLY all officers have marched during their service and know all about it, but some there are probably who have passed most of their service abroad, and others who have served mostly at home ; therefore as one who has had a great experience of marching in both countries, I have compiled these few notes with the hope that they may prove of assistance in some cases.

It is perhaps scarcely necessary to insist upon the importance of having the horses fit to march, before going on the road, hard and full of muscle, or to say that the harness should be soft and pliable, not harsh and brittle with beeswax and heelball, that the saddles should be in good order and not restuffed and pricked up some three or four days before starting (a certain cause of sore backs) : that the valises should be well curved over the backs and should not be flat, and that the arches of the saddles should be well fitted to the withers of the horses. Still I have seen batteries at the end of a march arrive tied up in a sheep skin and numnah, the horses covered with galls, and looking like towel horses ; I have seen cavalry with scores of sore backs, and these things I imagine must have come about owing to the C.O. having started unprepared and with fat, soft horses.

If horses start well on a march, and are treated judiciously for the first few days as regards the rate of travelling and halts they will arrive at the end in the best of condition, hard and bright, with no loose flesh but all muscle ; provided of course the forage be fairly good and the weather ditto.

The officers should look over all saddles and harness carefully before starting, and see that everything fits, that all ties are made up and in good order, all the carriages in good repair, the horses shod up to date, and also that the store shoes are complete.

Officers.

They should lay down distinctly what kit is to be carried in the valises, etc. on the road, and what is to be packed in bags or left behind. They must insist on the kits being properly packed in the valises and blankets daily ; I once opened a bulging valise on the

Limerick and Tarbert road when starting on a 43 mile march, and found 4 lbs. of bacon in the centre, a nice lump on a horse's backbone! The officers must also see that kits if left behind are properly packed and stowed away in a safe store; the engineers may strip the roofs off your barracks while you are away, without letting you know, or without asking you to hand over, and the rain may come in and ruin the kits if left there. It has happened to me, and by some extraordinary reasoning I was ordered to make good half the damage, though I had left sentries and watchmen over the barracks, and had received no orders to hand over and vacate.

In India the officers should see to the details of carriage for tents and baggage, mess traps and cooking utensils (this is often neglected).

Farrier.

The Farrier must look well to his shoeing, no long toes on rough and stony roads, a broken knee on the march is a very bad case. He must fit and pack his store shoes, no time on the march for much fitting, he should fill his field companion with dressings and physic, and also the regimental or battery chests. The government supply is but a poor one and none too liberal, so he had better ask the C.O. to buy a few simple things, such as carbonate of ammonia, ginger, iodoform, nitric, ether, laudanum, camphorated carbolic oil, epsom salts, and some extra bandages and medicated lint. He must see to his needles and suture wires, weights and scales, and thermometer. He should also make up a few balls, two drachms carbonate ammonia, three drachms ginger and put them in a tin box, and mix a bottle of simple dressing for each shoeing-smith's satchel. Also he had better have two or three hinged shoes ready for the shoeing-smiths to tack on the road if necessary.

Collar-makers, and sadler sergeants.

The Collar-Maker should make up a few small pads with ties, and a set or two of skeleton harness in case of galls. Links and traces will sometimes rub from horses pulling unevenly; a few little shields of leather, and a few bits of sheep skin with ties should be made up so as to be able to pop them on quickly on the road; he should make up a dozen or so "dealers" or "Yorkshire boots;" horses will brush at times however well shod, and the soft cloth boot is far superior to the nasty hard leather things with straps that Collar-Makers delight in making.

What is wanted is merely a square or rectangular piece of old horse clothing, with a tie in the centre to fasten round the leg, the top half folded down over the tie.

The Sergeant-Major should see a box packed up with all writing materials and forms that he is likely to require on the road, the Pay-Sergeant and the Quarter-Master-Sergeant, if the latter is marching, should do the same. In England the Q.-M.-S. will not be on the road, but in India he marches with the regiment or battery, or rather a day ahead carrying his office with him.

MARCHING AT HOME.

Orders are sure to be received with the route some days before the start, and it is well for the C.O. to ask the firm with whom the regiment or battery bank to write to their agents at the different towns

along the road to honour drafts. The Captain, Q.-M.-S. and some few old married men will be left behind to close the barracks, send off the heavy baggage and kits, and to hand over to the Barrack Department; they will then, if the regiment or battery is making a permanent move, proceed by train to their destination; but if the vacation of barracks is only temporary, a senior N.-C.O. and one or two trustworthy men, such as the storeman, will be left to take care of the barracks and stores during their absence.

The billeting party, which for a battery or squadron consists generally of two N.-C.O.'s. and two privates to look after their horses, will precede the battery or squadron by one day. The N.-C.O.'s. (and especially the senior) should be very intelligent, reliable men, with tact and good manners; for the comfort of the men depends a great deal on these doing their work in a satisfactory manner. The route or a copy of it will be in their charge, and on arriving at the town or village where the halt is to be made for the day, they should proceed and report their arrival to the Superintendent of Police showing the route; he will then issue the billets for themselves and their horses for that night, and later will give them in detail the billets for the regiment or battery. They should go round with a policeman and visit all billets and apportion them off, taking care as much as possible to keep the different units together.

Billeting
party.

The parade ground or gun-park is generally in the market place, and they should rent a room close by for a guard-room. The Sergeant-Major, Farrier, senior Trumpeter, and Pay-Sergeant should be billeted close to head-quarters.

The billeting party should then draw up lists of the different houses, with the names of the streets where the billets are situated, for the use of the C.O., the Pay-Sergeant, the Sergeant-Major, and also for the subalterns and sergeants for their special commands.

It is advisable also for the senior N.-C.O. to draw a rough sketch of the village or small town, filling in the names of the streets, head-quarters, post office, station, and so on for the convenience of the C.O. This of course is impracticable in large towns. (We had a German bombardier in "C" Troop in 1879 who had served in the Prussian army; he spoke broken English but his maps were wonderful. This man was promoted from "C" to "A" Troop in 1880 and deserted very soon after, he had a clean defaulter sheet, and had risen to Sergeant in about three years.)

The billeting party meet the regiment or battery when it arrives just outside the town and shows the C.O. the way to the parade ground or gun-park, where they will distribute the lists and billets and give any directions they can to guide the men. This being done the party should get ready to go on to the next halt on receipt of orders from the C.O.; it saves a deal of work to send the billeting party on by rail if possible; it gives them more time and they get through their work easier; I invariably did so myself, and it costs but little.

It is a good plan to pay the men daily at the mid-day halt, one day, say, one shilling, the next day eighteenpence, thus avoiding very small change. My own plan was as follows: this daily pay was put

Pay
department

by the Pay-Sergeant and myself overnight into six little bags, two of which I gave at breakfast the next morning to each subaltern, I kept a double set of bags and the empty ones were returned to me on my issuing the full ones; the bags were marked with the sub-division numbers.

I carried as a rule money enough for one day or two, but it depended of course on our vicinity to a bank. In some places there might be no bank at all.

I gave the Pay-Sergeant daily the billeting money, and calculated out the pay, and entered it both in his pay-book and in my pocket-book; the Pay-Sergeant should accompany the C.O. round billets in the evening, and pay all up in the presence of the different sectional officers, taking receipts, which he should file—I had a book for him. Never but once, in my experience of several long marches, have I had a demand for repayment from an innkeeper, for the reason perhaps that an officer was always present to witness the payments. I also recommend that a copy of all payments be kept by the C.O. personally. Pay-books may get lost, therefore a duplicate is useful; I had at one time a Pay-Sergeant who was a capital fellow but inclined at times to go on the spree; he did so on the march once, and lost his books, and if I had not had a copy I should have been in a fix.

Marching

About 8.15 or 8.30 a.m. is the best time to get away on the road, it is not easily managed earlier, for the hotels and public-houses are not open much before 6.30 or 7 a.m., neither is it good for man or beast to make too early a start, unless the weather is abnormally hot. I remember once trying to start out of Bath at 6.30 a.m. to catch the tide at Avon mouth and embark on that terrible old tub the "Assistance" for Ireland, half the men could not get into the stables, and half could not get out of the inns before 5.30 a.m. and so we were nearly an hour late in getting off. Many C.O.'s have a good plan of giving a cup of coffee and a biscuit at parade before falling in; the plan I recommend is to have the camp kettles packed overnight with 4 oz. of cheese and $\frac{1}{2}$ lb. of bread a man (in a regiment this can be put in the squadron carts); at the half-way halt, pay, water the horses, and let the men lunch, the halt should be made near a public-house and near water, to enable the men to get a glass of beer or lemonade, and the horses to be watered if necessary. From an experience of a long march, I found that after the first ten days very few men drank wayside inn beer, because it was so bad and so dear; my reason for recommending the half-way meal is, that young soldiers especially, on arriving in billets at say 1.30 or 2 p.m. hot, dusty, and very empty, often drink straight away the two pints of beer allowed them before eating anything, this amount on an empty stomach makes them unfit for work and the horses suffer. If, on the contrary, the men arrive having had a good lunch of bread and cheese, they do not want the beer at once, and even if they take it, it has no bad effect; they are ready to get to work on their horses and when they have done them up, they have their dinners, and enjoy them, with a pipe after as they finish their work.

Halts.

About fifteen minutes or so after marching off from the place of

parade, or when clear of the town, a halt should be made to tighten up girths, and look round; horses invariably empty themselves at first when coming out of stables; also when their backs are cold, will not allow themselves to be properly girthed; again, some of the men may have been late and hurried, and their kits and gear a bit askew in consequence; but remember on girthing up not to over girth, a tight girth is as bad for a horse or a deal worse than a loose one; I have seen horses swell up terribly from overtight girthing, and it takes days sometimes for the swelling to go down.

A cavalry regiment or battery R.H.A. should travel at the rate of 5 miles an hour including halts; a field battery about 4 miles an hour. To manage this you will have to shove along, and not waste much time; a twenty minutes halt to water and lunch; and a five minutes halt every hour is all that is wanted on an ordinary march. For the first two days the pace should be a bit slow, about 4 miles an hour, the horses must be accustomed gradually to the work, on a long march about half way before the mid-day halt, I recommend a long trot of 3 to 5 miles at a stretch, and a little longer halt, say half-an-hour to 35 minutes, every advantage should be taken of the road and the state that it is in. To avoid dust, and crowding and checking in rear, sections and squadrons should march independently with an interval of two or three hundred yards, nothing distresses horses more than an uneven pace, which is hard to avoid when in rear of a long column.

Pace.

When guns are halted for watering or feeding for any length of time, put on the drag-shoes, it prevents accidents. I once knew of a case where three teams got away, and some horses were badly injured; this was not in my own battery. Do not let the horses drink too much, a few goes down, and a wash out of the nostrils is all they should get.

Watering.

If the march be over 20 miles I recommend a half feed being carried and given on the road, but if under that distance this is not necessary; far better for the horses to eat it in the stables where there is less waste.

Feeding.

On arriving at the place appointed for parade or gun-park, usually the market place, the Nos. 1 or sergeants should distribute the billet papers to the men, and direct them as far as possible to where they have to go; the men when broken off will file away at a walk. The guard should mount at once, a guard-room having been rented close to the gun-park or parade. In a battery, the Wheeler should with the limber-gunners see that the guns and carriages are all lined and dressed immediately, you cannot be too particular about this being well done, the limber-gunners should take all kits off, and file off to their billets, returning after dinner to wash the guns. The Wheeler will be in charge of the gun-park, and should look to all wheels and fittings daily. The time of arrival is generally between 12 and 2 p.m., the officers having given orders to the sergeants or Nos. 1 where, and at what time to meet them, will go to the hotel where they are billeted, and the Sergeant-Major and Pay-Sergeant having received orders as to what time the C.O. will go round billets, can do the same. The officers should start round their billets about two hours or so after marching

Billets.

in, and see that all is correct, Shoeing-Smiths, Collar-Makers and Saddlers should go round their sections during the afternoon, to do anything that is required of them, and the former will report all casualties to the Farrier. At about 4 o'clock the C.O. will go round billets with the officers, the Sergeant-Major, Farrier and senior Collar-Maker, in small towns it is easy to visit all, and I always made a point of doing so myself, but in very large towns, and especially in the suburbs of London, the billets are so scattered that to miss some of the extreme outlying ones might be unavoidable. All casualties should be pointed out to the C.O., also anything wrong as to stabling or the accommodation of either horses or men, and he will then adjust it.

I generally made a point of seeing the landlord and of having a chat with him, sometimes there might be a little trouble to be smoothed over, but in most cases this was easily done, I generally found all very willing to please, and in parts of the country where troops rarely go, they were delighted to have them and fête them. The Sergt.-Major should warn the hour for parade, and arrange any changes in horses as he goes round and the Pay-Sergeant should pay the billets. If the Farrier notices any horse at all off, he should administer a ball as laid down, and see that all small chafes and sores are dressed.

Backs. The sectional officers or subalterns should instruct the men, when the saddles are removed, to wisp the backs well over, or beat them with the palms of the hands for five minutes, and then quickly dry them to promote circulation and prevent lumps rising; if the horses can be racked up so as not to roll, it is better to leave the saddles on till after the men have had dinners, and groom the rest of the body first; the N.C.O.'s should examine and feel every back carefully daily, reporting any tenderness at once to the officer in charge; swellings often occur from overtight girthing, especially at the mid-day halt when watered and fed. An overtight girth is a very painful thing to a horse.

I recommend before marching that a dealer's halter be purchased for each horse (I carried them rolled and folded on the near side), they save a deal of cleaning of head-collars and head-ropes, and the men will be much pleased. The Sergeants should report to the Sergt.-Major again at roll-call at head-quarters.

Police. In case of any disturbance (very rare), or if there be any men or prisoners to be confined, the police will take charge of them, and look after them carefully. I remember in 1880 an old gunner in "C"

Cells. Troop at Blandford, who had slipped his head-collar, and was creating a disturbance, and whom we had to put in police-cells with a cut head. Poor Cumming, afterwards surgeon in the Guards, since dead, and (the orderly officer) myself went to see him, popped a couple of stitches in his head, gave him a drink (an emetic), and left him; in the morning the kindly constable's wife told me that the poor man felt so sick that he could not eat a couple of new laid eggs she had given him for breakfast. A pair of handcuffs or two should be carried on the road.

Defaulters. Billeting is not too popular among landlords, especially in much frequented routes, such for instance as Woolwich to Okchampton, they get too much of it and the pay is not good, but in places where few troops pass through, the landlords are most kind, and the men and

Landlords.

horses fare sumptuously. Of course a great deal depends on the behaviour of all ranks, and on the tact of the officers and N.C.O.'s. When I marched as a C.O. at home, I gave the men before starting a little lecture about behaviour in billets, and told them that a civil tongue and a ready manner, especially with the ladies, often meant a breakfast in the morning; they evidently took the hint, for I had not one complaint in six weeks, nothing but praise of them from the landladies, and the men were nearly all of them under three years service. The young officers should also try and have a chat with the landlady or landlord at every house, it does good, not only to your men but to those who follow after; I have marched in the wake of corps that have made themselves liked by their courteous behaviour, and also in the rear of others that have got themselves disliked by their own rough manners.

As regards the officers own billets, officers are apt to forget that 2s. for a bed and a private sitting-room is not what the innkeeper is accustomed to get, and that in busy times they may be a trouble and a loss; I have followed a battery where the officers grumbled apparently at every inn at 5s. a head for dinner and drank no wine (possibly they may have been teetotalers). I think myself one should do something for the house, and for the credit of the army, and in all the batteries I have served with, and marched with, we always had a bottle, and if good a couple of the best port in the house, and I have unearthed some rare good stuff too in out-of-the-way inns, especially in hunting counties.

Hotels.

Sometimes it was almost impossible to get a private sitting-room, and we have gone without to do the landlord a turn, and have been treated none the worse in consequence. With but one or two exceptions, I have invariably been well done and the officers have always parted the best of friends with the landlord and staff. As a subaltern I have a vivid recollection of some old British brandy in the commercial room, at I think the Bear Hotel at Bath, and some whisky at Roscrea that took a deal of beating, though I had a bad head the next day from either too much or too little of it.

Both officers and men should be made to dress as smartly as possible on the march, and when about the streets, it does a deal of good to the army, also there are lots of old soldiers, both officers and privates, in all country towns who are on the look-out, and it soon gets about as to whether the soldiers be a smart or a dirty lot. I regret to say I have met batteries of R.A. and have heard of a battery of R.H.A. (it must have been a very bad one) of which the officers marched in serges. I also insisted myself on all officers dressing for dinner at the inns, just as they would do at mess.

Dress.

As doctors do not now accompany troops on the march, a medical practitioner can be called in if required, the man if necessary will be sent to the nearest military hospital by rail; if too bad to move, to the civil hospital; the same in the case of horses; it should be borne in mind by all ranks that it takes but a very few sick horses to disable a battery, and thus every care should be taken to prevent casualties with batteries not on full establishment.

Sick.

With dis-
mounted
party.

A small dismounted party is allowed by rail daily some 12 to 20 men. The new guard, officers' servants and grooms should go on with the officers' baggage, where there is no railway they must of course ride or march.

In conclusion, as an instance of a successful march, I may refer to that of 66th Field Battery from Christchurch to Okehampton, 3 weeks in camp, back to Christchurch, and on the next week to Newcastle-on-Tyne, roughly 680 miles; all young soldiers and three 2nd Lieutenants, no horse was left out, only two men were sent sick, one to Sheffield, and one detained at York; there were no complaints from the police or landlords, not one regimental entry, and not one case of drunkenness on the way, although at some of the places billeted at, a battery had not been seen for 20 years, and in some of the mining towns on Saturdays very nearly the only men sober in the public-houses were these young soldiers. What spoke also well for the subalterns, the Sergeant-Major, and the Nos. 1, was that the battery never once moved off parade more than 5 minutes after the time appointed to start, and nine days out of ten was ready to move off when the clock struck the hour.

MARCHING IN INDIA.

Whereas in England, the men billet and are fed, the baggage going on by rail, in India on the contrary, the men are in tents, and all supplies, light baggage, cooks, servants, etc. accompany them on the road; the preparations for a march in the latter country are thus more extensive, the details require thinking out before starting, tents have to be drawn, carriage requisitioned for, and notices sent to the civil authorities in the districts that your route takes you through, so as to ensure supplies being collected at the different camping grounds; these grounds are all laid down in the route book; care must especially be taken to give due warning to the Durbar officials, when passing through native states, and a probable estimate for all the different supplies should be sent to them. A commissariat agent is sent with the regiment or battery to procure and arrange for all supplies, and to pay for all Government issues, he cannot always though get quite what is wanted, and it sometimes happens, especially in Native States, that the proper supplies are not forthcoming unless early and repeated warnings have been written on through the proper channels; this agent should report daily to the C.O. at each camp, that everything has been settled up for by him, and that he has the receipts, the head man of the village being present also so that the C.O. can personally satisfy himself that such is the case.

Supplies.

Tents.

The best tents for the march are the I.P. General Service 160 lbs. single fly tents, to hold about 10 to 12 men; the E.P. takes too long to pitch, and is too heavy to pack and carry, though when once pitched it is more roomy, and being a double fly tent is much cooler, and decidedly better for a standing camp; in the Madras and Bombay Presidencies, the sun is hotter in the marching season and E.P. tents are more used, still for marching and camps of exercise the small handy tents are preferable in every way, for in case of rain it is im-

possible at times to move with E.P. tents, as they become from the moisture too heavy to carry.

The transport for troops varies much in different parts of the country and in different stations. At large stations you may get all mule carts, pack-mules, or camels or elephants; it depends much on the district; at smaller stations where there is no commissariat dépôt, the transport will consist principally of country carts and camels hired for the march only. In all cases some of the transport will probably be hired carts. Mule carts and pack-mules are the best of all transport, they can if well looked after travel almost as fast as the troops, they are easy to load and unload, mules are also very hardy. Camels are slow, they cannot travel in wet and are disagreeable brutes, and none too nice or easy to load. Elephants are also lumbering, delicate and slow, and country carts, though easy to pack and requiring but little looking after, cannot travel at more than $2\frac{1}{2}$ miles an hour; most regiments and batteries up country keep up a certain mule cart transport of their own, enough for line gear and kit at any rate, if not for the tents. An indent must be made out for the authorised transport, and sent three weeks before the march to the Chief Commissariat Officer to check, as well as that for any private carts required (unless the C.O. prefers to get his private carts direct through the collector and civil authorities). Half the rate is generally paid in advance for private carriage, and when carts are once taken over, strict watch must be kept over the cart men, or they may bolt, for many are impressed and don't care for the job; a number of private carts are always wanted for officers, canteen stores, sergeants' mess, coffee shop, master-tailor, syces, native followers, etc., etc.

The transport will be collected by the commissariat authorities, and handed over the day before the regiment or battery moves; the transport officer (in a battery the captain) should take it over, and with the Q.-M.-S. detail it all to the different units, giving the subalterns and sergeants an exact list of the transport apportioned to their commands, with instructions as to how everything is to be carried. A senior N.-C.O. should look after all commissariat transport, the regimental transport of a battery has an N.-C.O. already in charge, and that of a regiment an officer. A guard should be detailed daily, in a battery of from 5 to 6 men, to accompany the baggage on the road.

The best and quickest means of transport, such as mule carts and pack-mules (if the transport supplied is mixed, as is generally the case), should be taken for the line gear, the men's kits, cook's traps, and things that are first required on arrival. When marching with other corps it is wise to have a distinctive mark or colour for your own regiment's or battery's baggage, some regiments have small flags on the carts etc., but coloured puggaries for the native drivers answer better as they do not so easily get lost, and they have the additional charm of pleasing the natives hugely, especially if made of a good striking colour. The tent bags should all be labelled with the number of the section or sub-division, painted on large leather labels securely sewn on; and the mule carts or camels told off every day to do the same work and in the same place.

The Government and private transport, with the exception of officers' private carts, etc. should be parked in a place told off daily, and the feeding and watering of the animals carefully seen to; the Farrier going round and inspecting all the animals at each camping ground.

The
Q.-M.-S.'s
camp colour
party.

The Q.-M.-S. with the camp colour party, and the grain grinding machines should proceed the afternoon before to the next halt, to lay out the camp, draw supplies and get everything ready.

In a regiment the Q.-M. of course may be in charge of the advance party. The camp grounds and horse lines being marked out with thin cords and large and small flags (regimental colours). He should see to the rations (mens and horses), get the grass in, or procure what he can in lieu of it if very bad; he should make arrangements for watering, damming up a nullah, hiring bullocks to fill a trough, if there be one, or what not (a few canvas drinking troughs should be carried by each squadron or battery, they are most useful), he should see the cooking places marked out; the cooks go on ahead every afternoon under the cook orderlies, so as to be in time to prepare breakfasts. It is well to give the cooks the quickest and best carts of the transport and every advantage you can, for much depends on them. In my battery I have a spring cart into which I put a horse to carry the cook orderly and cooking gear, but a mule cart is as good or better.

The Q.-M.-S. should arrange about water for drinking, and set up filters which he carries on with him, and the conservancy men under him will see to the digging and marking out of the latrines, these should be marked out by flags, a portion of the regimental conservancy establishment marches with the advance party.

He should send for letters if there be a post-office and in fact make all arrangements possible. The regiment or battery will probably march in about 11.30 a.m. if the roads be good, or perhaps a little before; the breakfasts should be ready about $\frac{3}{4}$ of an hour after that time; the Q.-M.-S. however will get instructions daily from the C.O. at about what time to expect him.

The hour of
starting.

The time to start is about 8 a.m., not before 7.30 at earliest, unless the march is known to be a very long and tedious one, or there are more troops on the road; it is bad for both men and horses to start earlier, neither is anything gained by so doing. When I first marched in India in 1875, in the Bombay Presidency, there was an insane habit of starting at 4.30 and 5 a.m. in fact in the middle of the night, I never knew why, perhaps the doctors ordered it; I believe in those days regiments always paraded about that hour; now, thanks to Sir George Greaves they know better; of course in those parts, or in Madras, if marching very late in the season, you might perhaps start at 6.30, though personally I am against starting before 7.30 unless under special circumstances.

Any man, whether white or black, should be punished who hammers a tent peg, or makes a noise before reveille sounds, unless this is done you will have the men and syces hammering up pegs, and harnessing up horses before 5 a.m. and there will be no rest; on no account either should a horse be stripped, or a saddle put on, before boot and saddle sounds, half-an-hour before the time to march off; fifteen minutes after

reveille, feed should sound, the tents should then be struck by bugle-call, and packed; an hour gives ample time to do all. The camp ground should be cleaned up, and straw and rubbish burnt by the rear-guard, who should see this carried out before moving off.

The coffee shop should go on half-way over night, so that the men can obtain a cup of hot coffee and biscuits or cake at the halt. The plan I recommend is to halt and look round, if necessary water and feed (but this only on long marches), and then for each sergeant or No. 1 to send a N.-C.O. and a man to draw coffee and cake, etc. for every man in his section or sub-division; the coffee and cake is all put out ready in cans and baskets, with three or four pannikins per sub-division by the man in charge of the coffee shop, he having the night before received intimation of the number per sub-division; this saves the men leaving their horses and avoids crowding or fuss, a man will at the same time go round the battery with extras and cigars; the mess can arrange for the officers' coffee or tea, etc. to be at the same place. I pay the coffee shop, and pass it through the men's accounts at the end of the month. The coffee shop then packs up and moves on quickly to set up in camp, a portion having already gone on ahead. Before starting on the road, the officer in charge of the coffee-shop should make arrangements for a good stock of tobacco, cigars, cheese, bacon, soda water, lemonade, etc., etc. to carry on the road, and also on a long march, that consignments meet the battery at places where the camping ground is near to a railway station; a well organised and furnished coffee shop is a great boon on the march.

Coffee shop

The canteen will make similar arrangements for beer, this can generally be done, as now the trunk roads are always meeting the lines of railways. Rum being easier to carry than beer, a certain amount of it can be taken if there is any possibility of being a long time distant from the rail.

Canteen.

On arriving at the camping ground, the lines and gun-park will be found already marked out by the Q.-M.-S., also the places for tents, the regiment or battery then draws up on the ground allotted for parade or gun-park, and proceeds to water and picket; a battery draws up its guns in line, the wagons covering them (small flags having been placed to mark where the points of the shafts should be for the guidance of the drivers), unhooks, and while the drivers and horse-holders file to water, the duty numbers lay down the picket ropes, lines of white cord having been pegged out for them to follow, the sergeants taking care to dress all the picket posts and heel pegs correctly. I carry a spare set of strong iron posts in my battery also servicable heel pegs, and a few iron mallets, as the Government issue knock up in a day or two. The horses then file on the lines, and are tied up by their head-ropes until the line gear arrives, which it should do in from 20 to 30 minutes, that is if conveyed on mule carts; after filing on the lines a little grass should be given at once to each horse to keep him quiet until the line gear comes in; the men then roughly groom the horses over, and take off kits, in about fifteen minutes the order "off saddles" should be given, and the horses' backs sharply wisped, or beaten with the palms of the hands and well dried to promote circulation, and to prevent heat lumps rising, the blankets should

Camp.

then be folded over the loins if hot, if cold the horses should be blanketed up, and the men turned out for breakfast, having previously given the horses their feeds, these will all be mixed and prepared, as the line orderly and his party will have come on overnight; the grass and grain crushers, etc. will be in the centre of the lines at the end. Allow an hour for breakfasts and then turn into stables, if the tents are in put them up first, this should be done by the Orderly Officer, as laid down in regulations. Dinners will probably be ready about 3 or 3.30 p.m., according to the hour the regiment or battery marched in. Stables and water between 4 and 5 p.m., then feed, give the last feed about 8 p.m. and with it a good proportion of the day's grass, it keeps the horses quiet at night. The Q.-M.-S. and party should move off about 2.30 p.m. and the cooks about 4.30 p.m., one or two of the latter being left to serve up teas.

Feeding.

Gram is generally easily obtainable and good, but bran may be hard to procure. On the Madras side you may have to take cooltic, which must be boiled, boosa or chaff can be often obtained, and serves instead of bran; grass is very often bad and very hard to get, in which case kirby or chirrie, the stalks of jowari, and bajori, or sugar-cane are fairly good substitutes. There are several grains that can be used in emergencies, barley, Indian corn, mote, barjree, urreed, etc., these can often be obtained in the villages. If half a feed be taken on the road, it is deducted from the morning feed; when marching off trunk roads and on cross country tracks it is always wise to carry a half feed; I have personally had experience of some very rough roads in Khandeish and Rajputana, and once or twice spent a day or more crossing a river.

Veterinary
Surgeon-
Farrier.

A Veterinary Surgeon marches with a regiment but never with a single battery, the Farrier in his absence should take his place as far as possible, and the C.O. should see the Veterinary—history sheets are kept up to date, very sick horses can be sent in by rail (if near a railway station) to some military hospital. The Farrier should carry a good supply of ready mixed drinks, and also the ordinary medicines to make up on the road, a good stock of bandages, carbonate ammonia, ginger, vasiline, and simple dressing, antiseptics, etc. He must arrange to carry some charcoal for the field forge, and a certain amount of iron for shoeing purposes, his forge will be set up daily in the place told off for it, if possible under a tope of trees, where he can carry on his work protected from the sun; as there is always Sunday's halt, and one day a fortnight besides, he has ample time to keep the shoeing up to date; charcoal and iron can nearly always be purchased in the larger native bazaars on the road.

Wheeler,
saddler
and collar-
maker.

The Saddlers, Collar-Makers and Wheelers and other artificers will have a tent pitched for a shop, the former will probably have a good bit to do, and must draw their supplies from the store wagon as required. The Wheeler has charge of the gun-park in a battery, and should dress all wagons at once on arriving in camp, he should examine every wheel throughout daily, and see that they are cleaned and properly greased.

The mess.

The officers' mess should have two sets of tents, one to go on ahead every night, and the other to stay till after breakfast next morning, and then to follow on, for the same reason also nearly a double supply

of servants is required, it is also essential to have a first-rate cook, or better still two for the march.

A good supply of stores, wines, etc. must be laid in and carried on carts, arrangements must also be made to pick up fresh supplies at railway stations on the road, also with the postal authorities to send on letters and papers; a list of post towns, with dates of arrival at each, should be furnished to the postmaster before leaving for his guidance.

A native banker usually accompanies regiments and batteries on the road, and he carries money which should travel under guard; in case of his not accompanying them, the money will be carried regimentally also under a guard, the money being placed every night in the guard tent under a double sentry. A native banker however saves a great deal of trouble.

Money.

A good supply of oil must be carried on the road, though kerrosine oil is obtainable in nearly all bazaars. Each tent should be supplied for the march with a strong hurricane lamp, these lamps should be filled and trimmed daily by one man detailed by the Q.-M.-S. for the job, he is generally the same man who superintends the filters and conservancy. In a standing camp large lamps placed at intervals of 20 yards up each side of the camp, outside the tents, and with the number of the regiment or battery painted on the glass, are very useful.

Lights.

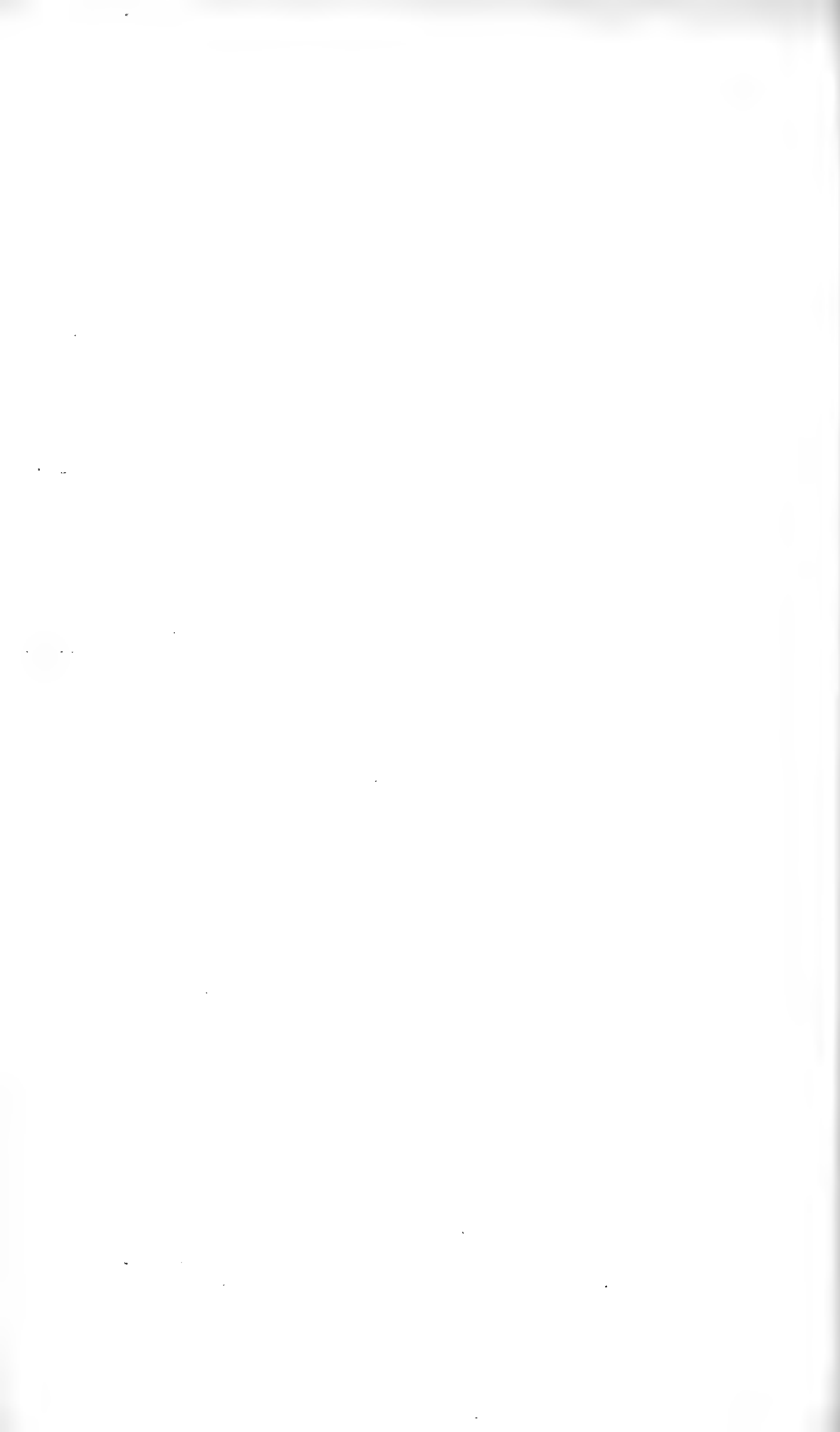
Chowkidars or watchmen should be obtained nightly, the head man of the village is obliged to supply them free of cost, it is a form of blackmail, but still if chowkidars are not employed compensation in event of robberies will not be obtained. This holds good in native states especially, but there they may have to be paid for.

Chowkidars

In rough countries where marching is often done on cross country tracks, it may be necessary to have a guide, he should also be obtained from the head man of the village.

Guides.

Marching in India may appear on paper to be a more tiring and tedious business than marching at home, but after the first few days when the men have learned to picket, pitch tents and the routine, and the transport and all ranks know their places, the work is really less for both officers and men than it is on a march in England; camp life is good for all ranks, and enjoyed by all for a period, if the weather be fine, there are no inducements to drink, and the sport and shooting obtained on the road give great amusement to everyone, the men also learn more real soldiering during a month in camp than they do during 6 months in cantonments. The people who have a rough time, and are hard worked are the syces and followers, they are however as a rule a cheery and hard working lot; their wages being very small, every consideration should be shown them, such as giving them (out of the funds) a cart or two for their traps and kits, and a few spare tents if there be any to shelter them in case of wet weather. In concluding I must apologise for having spun out this paper to a greater length than I had originally intended, but many small details struck me in writing, all which may be useful as a guide to some. I have laid down no new theories, the whole is an old story, but as I constantly meet men coming out as Majors and Captains to India, who have never served in it before, any small hints will be acceptable to them I feel sure.



A LIST OF THE ARTILLERY COMPANY IN SCOTLAND AT THE TIME OF THE UNION, AND THEIR PAY.

BY

CHARLES DALTON,

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THE Military Establishment for Scotland included, for many years prior to the Union, a permanent Company of Artillery whose headquarters were at Edinburgh. This Company was sometimes designated a "Train" but the latter appellation, which is to be met with occasionally in the Warrant Books for Scotland, may seem somewhat hyperbolic as the Company consisted of a mere handful of men, including officers, as appears from the following Establishment List.¹

" 1707.				£	s.	d.
" Captain of the Company at 8s. per diem...	...	...	...	146	0	0
Chief Engineer at 7s. per diem	...	...	...	127	15	0
Lieutenant and Bombardier at 5s. per diem	...	...	...	91	5	0
Commissary at 5s. per diem	...	...	...	91	5	0
Corporal at 1s. 3d. per diem	...	...	...	22	16	3
Tenn Gunners each 1s. a day	...	...	...	182	10	0
Six Practitioners each 6d. a day	...	...	...	54	15	0
				£716	06	3
" Proposed to be added:—						
" Six Bombardiers each 2s. per diem...	...	...	...	219	0	0
Two Minors each 1s. 6d. a day	...	...	...	54	15	0
One Petardeer at 2s. a day	...	...	...	36	10	0
				£1,026	11	3"

The names of the officers are omitted in above List but we get at them in the Warrant Books for Scotland where their several commissions duly appear. In 1707 the names of the Artillery officers were:

John Slezzer, Captain.
Theodore Dury, Chief Engineer.
David Livingstone, Lieutenant.
Colin Ramsey, Commissary.

¹ State Papers, Scotland, 1707, Bundle 3, No. 1.

Before saying anything about the Captain of the Artillery Company it is necessary to mention that the superior officers of the Artillery Company had their commissions from the King, or Queen, direct and not from the Master-General of the Ordnance. And the inferior officers of the said Company appear to have been generally appointed by the Commander-in-Chief in Scotland as will be shown presently. As regards their pay the Artillery Company were paid by the Lords of the Treasury in Scotland who seem to have been worse paymasters than the Honourable, though impecunious, Board of Ordnance in England.

Captain John Slezer is believed to have been a Dutchman but of his parentage and early career nothing is known. Nor has the date of his coming to Scotland been yet ascertained. In his account of himself as given in his Petition, or Case as it was then termed, setting forth the unjust treatment he had received at the hands of the Government, he speaks of himself as "a foreigner who had been honoured by the patronage of Charles II. and the Duke of York." It is certain that Slezer was Captain of the Scots Artillery Company for at least a quarter of a century and that he was a remarkable man who made himself a name in the world but whose fame, unfortunately for himself, was posthumous. That he was a zealous artillerist is abundantly proved but, curious to say, it was not as a soldier that he won distinction but as an engraver on copper and as a topographer. The labour of his life was his *Theatrum Scotiæ* showing the "ancient and present state of Scotland" with folio engravings of palaces, castles, noblemen's seats, &c., with descriptive letter-press. This valuable and interesting work, which has gone through several editions, bears witness to Slezer's skill as an engraver. The latest edition¹ contains a preface by the Rev. John Jamieson, D.D., giving a biographical sketch of Slezer's career which is taken almost entirely from "the stated Case of Captain John Slezer," printed in 1708, and a copy of which is given in the first edition of *Theatrum Scotiæ* now preserved in the Advocates' Library, Edinburgh. Dr. Jamieson's admirable review of Slezer's life only commences in 1690 before which date this writer owns there are no landmarks to be found bearing on the subject in question. But since the learned Doctor wrote the above biographical sketch several of Slezer's letters on military matters have been unearthed and printed by the Historical MSS. Commission.² These letters carry us back to the year 1681 when Charles II. thought fit to give a fresh impetus to Artillery matters in Scotland by augmenting the "Train" in that kingdom. With this end in view the Hon. John Drummond, Master-General of the Ordnance in Scotland, acting as the King's mouth-piece, issued "Instructions for J. Schlezar, Lieutenant of Artillery" to the following effect:

His Majesty having appointed some gunners to be levied for the attendance of his Train in Scotland "and there being none sufficiently qualified to be found in this kingdom at present" Mr. Schlezar was

¹ *Theatrum Scotiæ*, London, 1874, folio.

² MSS. of Chas. Stirling Home Drummond Moray, Esq.—*Historical MSS. Commission*, Report X., Part I., pp. 132-135

directed with the first convenience to go by sea to Holland and look out for "attenders following":—

"One Master-Gunner and Fireworker at 3s. per diem for twelve months at 28 days in the month.

"Two as near the same pitch of skill as he could obtain at 2s. per diem.

"Four well-qualified gunners at 1s. 6d. per diem who must all have been actively employed in the Service of the States General, of France, Spain, or Germany the time of the late wars."

He was also directed to order:—

"Two 12-prs. and four 3-prs. according to the models sent."

Mr. Drummond was to send Slezer "by first occasion" certain old brass ordnance which he was to sell "at the best advantage for His Majesty's Service," and having paid for the new guns from proceeds of sale "was to lay out the superplus as he should be thereafter directed." Slezer was also directed "to keep Mr Drummond informed of his progress and return before the 20th of May next." The latter stipulation was a physical impossibility considering what Slezer was expected to perform.

The above instructions were dated "Edinburgh Castle, 30 March, 1681," and were signed by "J. Drummond" who was afterwards known as the Earl of Melfort, Secretary of State to Jas. II. and the companion of the latter's exile.

We now come to Slezer's adventures in search of experienced foreign gunners which are detailed in a series of letters from the former addressed "to the Laird of Lundin,¹ Master-General of the Ordnance in Scotland, at Edinburgh Castle." For lack of space only the pith of Slezer's letters are now given:—

"Whitehall, 24 May, 1681.—Would at length get away; had taken places in the Harwich Coach. My Lord Duke and my Lady Duchess [of York] take journey on Thursday next for the Bath and he was to leave Friday after. Had been learning about the rank the officers of Artillery held in England and found that the Master of the Ordnance had always a Regiment and commanded all Major-Generals, except a Major-General be Commander-in-Chief. Had been promised £150 for his expences."

"Hague, 1 August, N.S., 1681.—Believed the Prince of Orange would give leave to gunners to go to Scotland but the pay was thought too small. 'When I propose the instructions I haive as to their pay peopel smiles at me. Those that in England, or Scotland, are called gunners aire called heer Stackyonkers or gentlemen of the cannon. Their pay is 40 gilders a month (at six weeks a month) in time of peace,

¹ Lt.-Gen. the Hon. John Drummond married first, 30th April, 1670, Sophia, daughter and heiress of Margaret Lundin, of Lundin, Co. Fife, and took the titular title of "Laird of Lundin" on his wife's coming into that estate.

beside the benefit of their quarters; now they aire tyed almost toe no kind of duyty; and in time of warre they haiue seuntie gilders a month.’”

“Rotterdam, 12 August, N.S., 1681.—Had been in treaty with Capt. Seilo at Amsterdam to be Master-Gunner, who had been 20 years in the service of the States, who would come if his salary could be brought to 4s. sterling a day and a commission were sent over to him. ‘I haiue gotten a tasck upon me that I wisch from my hart it was well off my handes to your satisfaction. For if I send ouer men that can doe no more then our aine men, it will be [said] ‘theis aire Slezer’s men, he can maicke choice of such bleads when he is entrusted with it.’ If he brought none he would be charged with neglect; and he could get no good men at the rate of pay allowed.”

“Rotterdam, 20 August, 1681.—Letter in French sent by Antoine Lermeny who had offered to enter the service of the King of Scotland in the Artillery. Slezer had engaged that his passage back to Holland was to be paid if he was not taken into the service and had given him 30s.”

“Rotterdam, 22 August, 1681.—Was to go to-morrow to Breda and thence to Antwerp and Brussels. The ‘caruing’ of the guns was begun by the Founder at Rotterdam.”

“Rotterdam, 23 August, 1681.—His fireworker was to go by another ship as Capt. Frissit might stay too long.”

“Dunkerke, 4 September, 1681.—The 24th of August last he went from Rotterdam to Breda where he met Capt. Maxwell, an acquaintance, who introduced him to Monsieur Bombel, the Engineer of the Place, who showed him several ‘bleads’ who offered to engage but asked too high wages, &c.”

“Rotterdam, 26 September, 1681.—His last was from Dunkirk and gave an account of his progress through the Spanish provinces—in which ‘insteade of gunners I didde not meet with a man whom I would haiue brought alongh with me for a metrosse. Went to Douay by Lisle (*sic*) where a Scotsman found him out who was in the *gens d’armes* who found him a ‘coppel of bleads’ in present service but they wanted higher salary. Saw the Foundry at Douay which turned out 16 pieces of cannon very curiously wrought every three weeks. Gives a description of the casting of the cannon and had spoken with the founder’s master-man about coming to Scotland to start a foundry there. Returned to Amsterdam two days ago. Could say nothing about the old metal till he saw it. Expected Capt. Seilo on Monday next and would send him away with the first ship. Saw the change that had been made in the Establishment and that he was to take one [fireworker] at 3s. per diem, one at 2s. 6d., and three at 1s. 6d., or two at 2s. per diem, which fell out very well as he had a

proffer of service from a fireworker in Denmark, by letter from Copenhagen, whose name was George Erdman Hummel who had served 28 years in the Artillery of the Elector of Brandenburg and who had written that Mr. Slezer need not trouble himself for gunners for he would make gunners enough 'if we give him but men that haue hands, feet, and coraidge.' The founder was soon to proceed with the casting of their cannon. 'I am in peine for our old brasse [guns], it has ben veerie hard wether this two days and I would give a plack to be at home again myself.' Hopes his precept on the Treasury would be looked after 'for I suspect my wife will be as skairce of siller as myself.' "

"Rotterdam, 30 October, 1681.—Had been badly used by Capt. Seilo but everybody told him he need not repent it 'for we should haue ben fascht with him.' Had got no answer from Copenhagen. Had heard of one Rokilje at Maastricht and had taken him on at 2s. per diem; he was no fireworker but had had the command of some gunners as Stackyonker—was of English parents and born at Cleve, and spoke very good English and was Adjutant of the Artillery at Maastricht."

"Rotterdam, 4 November, 1681.—No word had come from Copenhagen. Had been in treaty with a Capt.-Lieutenant of Miners—a Vallon [Walloon] black as a gipsy and had agreed with him to come to Scotland. The brass had not yet arrived. The mottos for the muzzles of the new guns sent by Mr. Drummond, '*Non sine fulmine regnat*' and '*Hæc regia vox est*,' Mr. Slezer thinks were so large as to spoil the shape of the heads, &c."

"Rotterdam, 18 November, 1681.—Would be able to send plenty of gunners. The Lieutenant of the Miners had accepted of 3s. per diem and was coming to Rotterdam. Had also taken on a fireworker at 2s. 6d. per diem; he had been long in service and present at various actions. Had also taken on the Captain of the Canoniers at Breda at 2s. per diem. 'He is a lustie bleade, has ben serdgent before the year '74 and euer sence by the Artillerie.' "

"Rotterdam, 24 November, 1681.—Requests a bill of credit as there were many expenses to pay. The cannon would not be ready for 6 months. The old brass arrived last night. Had not heard from Copenhagen. Expected the Capt.-Lieutenant of Miners and the fireworker from Maastricht every day. 'So soon as they come they are to be thrown into a ship and away with them.' Thanks Mr. Drummond for his approbation of what he has done about the mottos on the guns and adds: 'I hope you wont thinck sheame your naime stands upon them.' "

The above is the last of Slezer's letters from Holland. It is to be presumed that he set sail for Scotland the end of November, 1681, in

company with his Wallon Capt.-Lieutenant of Miners who was "black as a gypsy," the Captain of the Canoniers at Breda who was a "lustie bleade," the Stackyonker from Maastricht and a few gunners. But Slezer had to sail without Capt. Seilo, the Amsterdam Master-Gunner, and Capt. Hummel of Copenhagen, who felt competent to make gunners out of any men with "hands, feet and coraidge," as these "trustie bleades" required more "bawbees" than the Scots Establishment could afford to pay.

There is something sad, as well as ludicrous, in honest John Slezer being sent abroad to drive Scots bargains for the good of the Artillery at home when the Merry Monarch could always find money for his own worthless pleasures and still more worthless favourites.

The next news we have of John Slezer is in November 1688, when we find him in command of the Artillery Train and ready to take the field against King James' enemies. Among the MSS. of the Duke of Leeds is a letter¹ dated "Edinburgh, 20 November, 1688," from Capt. Slezer to Lieut.-General Douglas, Master-General of the Ordnance in Scotland, the pith of which is to this effect:—

Wrote this day "senight" with account of his arrival with the Train of Artillery. Account of his march to Edinburgh; delayed at Aylisson bank by reports of the rebels. *Need of additional men and of instructions about precedence of officers, and the writer's authority.*

From insular slowness, and insular ignorance, Great Britain did not grasp, until the middle of the last century, the absolute necessity for settling, by a Royal declaration under the King's Sign Manual, the vexed question of the Army rank of Artillery Officers.

In the *Acts of the Parliaments of Scotland for 1689* appears the following notice dated 18 March, 1689:—

"A report from the Committee for securing the Peace was read whereof the tenor followes 'It is also their opinion that the Canoniers and Artillerie men be drawn together under the command of Mr. — Sledzor (*sic*) and receives the Estate pay immediately and to continow and be maintained thereat as they were formerly, he giving his oath of fidelitie to the Estates.'"

Remembering the favour shown him by James II. Capt. Slezer refused to give his allegiance to the Scottish Parliament:—

"Mr. Sledzer being called and having refused to give his oath of fidelitie to the meeting warrand was given to secure him until he find caution not to return to the Castle [Edinburgh Castle.]"

When the new *régime* was firmly established Slezer wisely gave in his adherence to the new Powers and was reinstated as "Captain of the Artillery Company and Surveyor of the Magazines." His com-

¹ *Historical MSS. Commission—Report XI., Appendix VII., p. 25.*

mission was signed by William III. at Kensington 11 January, 1688.

About this time Slezer paid a visit to Court and renewed his acquaintance with William III. The latter writing to the Earl of Melville, Secretary of State for Scotland, from "Kinsington, ce 20 March, 1690," says :—

"Aujourd huy est parti Slezer avec l'Artillerie et munitions de guerre."—(*Melville State Papers*, p. 421).

As far back as the reign of Charles II. Slezer had been engaged on a *magnum opus* which was intended to be brought out with the fitting title of *Theatrum Scotiæ* giving "prospects" of the most notable palaces, castles, noblemen's seats, &c., in Scotland. The "prospects" were from large engravings on copper executed by Slezer himself, and the descriptive letter-press was also supposed to be by the same hand but there is no doubt much of Sir Robert Sibbald's handiwork in the scholarly descriptions given with the engravings. The first volume of above work was brought out in 1693, and Queen Mary, by Royal Licence dated Whitehall, 6 June, 1693, gave the author the sole right to print and publish the three volumes of said work, thus securing to him the copyright. Like many another man who has chosen the thorny path of literature Slezer found his book did not sell rapidly and that the chances seemed small of his recouping himself for the heavy expenses of publication. After waiting two years for the profits that never came the disappointed author exhibited his book to the Scottish Parliament who thought so highly of it that, to facilitate the completion of the work, they passed an Act,¹ for which they had the King's Warrant "in favour of John Adair, geographer, and Capt. John Slezer," which ran as follows :—

"Ordered that 16s. Scots be exacted from 1 August, 1695, for every ton of foreign ships which comes into any harbour or road within this kingdom, ilk voyage; and 4s. on every ton of Scots ships above 12 tons burden, once ilk year, for the space of five years to be applied by the Priory Council for compleating the saids Mapps and Prospects of Scotland and ordaine the same to be collected by the Collectors of the King's Customs."

Hope, which is said to spring eternal, once more revived in Slezer's breast. Speaking metaphorically he flourished the above Act in the faces of his creditors and told them "to bide a wee." He set to work on new copper plates, and ordered fresh printing presses, for expediting the bringing out of the second volume of his *magnum opus*.

Nor did Slezer neglect the welfare of his Artillery Company in the pursuit of art and literature. A general order was issued in 1696 for the Artillery to be encamped during the summer months. This order gave general satisfaction to the Artillery Company but there was one serious drawback to this plan and that was that the gun carriages were so old and rotten that they were quite unserviceable! By order of the Lords of the Scottish Treasury Slezer contracted with workmen for the

¹ *Acts of the Parliaments of Scotland*, Vol. IX., p. 492.

necessary repairs. Whether Slezer overstepped the limit allowed by the Treasury, or whether the latter were short of funds, certain it is that they only paid $\frac{2}{3}$ of the account, which was a large one, for these repairs. Added to his other debts, and heavy outgoings, Slezer now found himself obliged "for his personal safety" to betake himself "to the sanctuary of Holyrood House; here he had remained thirteen years at the time his *Case* was printed."¹

Notwithstanding the Act of Parliament passed in his favour, conjointly with John Adair, F.R.S., the map maker, Slezer appears to have benefited very little. Nor did Adair, in whose favour a tonnage act had been passed as early as 1686, fare any better, and the latter, in a memorial to the Priory Council, stated that his losses were "three times more than ever was gotten from the collectors upon the accompt of tonnage."² Comment on these facts is needless and it is not surprising to find that Adair, like Slezer, died in obscurity, and in debt, before the completion of his able work.

Early in 1699 Slazer had the misfortune to lose his eldest son who was a Master-Gunner at one of the Scottish fortresses. This event, small in itself, except to the bereaved parents, was followed by a violent quarrel between Viscount Teviot, who was Major-General and Commander-in-Chief in Scotland, and the Earl of Argyll who was Captain and Colonel of the Scots Troops of Life Guards. The bone of contention between these two noblemen was the appointment of a successor to Slezer's son as a Master-Gunner, and it is both instructive and entertaining for officers of the Royal Artillery, in the present day, to read of the storm of angry passions that swept round the little Artillery Company in Scotland nigh 200 years ago, because two exalted personages—one Colonel of the Scots Troop of Life Guards and the other Colonel of the Royal Scots Dragoons—had each a *protégé* ready to fill the comparatively insignificant post of a Master-Gunner vacant by young Slezer's death, and each declared emphatically that "his man should stand." The facts are as follows:—Lord Teviot, as General Commanding the Forces in Scotland, had, by virtue of the authority given to him, power to grant certain commissions in Scotland. This power he exercised when Slezer's son died, and he appointed one Crecutt, late a Lieutenant in Sir William Douglas's regiment of foot (which had been disbanded in 1697) to succeed young Slezer. The latter was hardly cold in his grave before the Earl of Argyll, without saying anything to Lord Teviot, procured a commission direct from the King granting young Slezer's place to his (Argyll's) nominee. In due course Argyll's *protégé* reported himself in Edinburgh to Captain Slezer and exhibited his commission signed by William III. Slezer was placed in a very awkward position as Lieutenant Crecutt had already taken over the duties of Master-Gunner, but as Lord Teviot was in London, and the Earl of Argyll was in Edinburgh, Slezer thought it best to go by the King's commission and so Lieutenant Crecutt was displaced and Lord Argyll's man (whose name does not appear) took over the coveted appointment. The displaced officer lost

¹ Dr. Jamieson's preface to the 1874 edition of *Theatrum Scotiae*.

² Memoir of John Adair, Surveyor and Map Maker, in *Dictionary of National Biography*.

no time in writing to Lord Teviot and airing his grievance. The equally irate Commander-in-Chief sent the following stinger to Captain Slezer¹ who was sorrowing for his first-born in Holyrood House:—

“LONDON,
“MARCH—1699.

“SIR,

“I thought you understood your duty better as to disobeying orders from such as command you which, in time and place convenient, we shall talk of; and now only once more command you to place that Crecutt who formerly was Lieutenant in Sir William Douglas’s regiment to be gentleman of the cannon² in the Artillery Company. It seems the Earl of Argyll will continue to meddle in business he is not concerned in which you may tell him he was not in this. You did very well. Know that a gentleman of the cannon never had the King’s commission and if it had been so it was not the Earl of Argyll’s to meddle with.

“I am, Sir,
“Your servant,
“TEVIOT.”

On receipt of this epistle Slezer re-instated Lieutenant Crecutt and displaced Lord Argyll’s nominee. This action was speedily reported to MacCullum More who appears to have been a man of strong passions and indomitable energy. He went in person and tackled Slezer in the Court of Sessions,³ where the gallant captain was a frequent visitor on account of summonses for debt, and taking Lord Teviot’s letter out of Slezer’s hand hurried off in a towering rage to Mr. Aitkin, the Secretary at War, who had the commission entry books in his office. From these books he took what he called “doubles” of certain commissions to prove that the King, who had the power of granting acts over all in the army, had given an act to Captain Slezer’s late son to be Master-Gunner as well as to other officers of like rank.⁴ Armed with these proofs Lord Argyll sat down and wrote a vituperative letter about Lord Teviot to the Rev. William Carstairs, Scottish chaplain to William III., who had the King’s private ear and who was consulted by his Majesty on all business connected with Scotch affairs—hence the court that the highest in Scotland paid this worthy chaplain who accompanied the King on his campaigns and who made a good use of the power he possessed. In order to lose no time Lord Argyll sent his letter to Mr. Carstairs, enclosing his “proofs” and the identical letter sent by Lord Teviot to Captain Slezer, by Lord Lorne who set off for London post-haste. And he followed up this budget by another letter

¹ The sub-joined letter to Captain Slezer is given in the *Carstairs State Papers*, p. 470.

² The term “Gentleman of the Cannon” as used by Lord Teviot is somewhat misleading for Slezer’s son was a Master-Gunner and is so noted in Lord Argyll’s letter to Mr. Carstairs, dated 16th March, 1699. In the Low Countries where Lord Teviot had passed most of his military career Gunners and Master-Gunners were styled Stackyonkers or “Gentlemen of the Cannon.”

³ Lord Argyll to Mr. Carstairs. *Carstairs State Papers*, p. 469.

⁴ “I send you,” wrote Lord Argyll to Mr. Carstairs, “a double of the King’s commission granted to George Caleleugh, immediate predecessor to Captain Slezer’s son who died last in whose place Teviot now has placed one.”—*Ibid.*

to the Rev. William Carstairs on the same subject in which he said: "I sent up a letter or two of his [Lord Teviot's] to Captain Slezer in one of which he treats me like a little ensign which I will not bear whatever be the event." This remark reminds one of the Border challenge :—

"O wha daur meddle wi' me!
And wha daur meddle wi' me!
My name it is little Jock Elliot,
And wha daur meddle wi' me!"

Having got his blood well up Lord Argyll sent an account of his wrongs to the Duke of Queensberry, Secretary of State for Scotland, and it gives us an insight into the power wielded by Mr. Carstairs when we find a letter from the noble Duke to the Scottish chaplain (Mr. Carstairs) begging the latter to settle this pretty quarrel between the two disputants as if it went on "there was no knowing what it would grow into." And Lord Argyll kept the ball going by declaring there were many in Scotland "would sooner have no army than have Lord Teviot for Commander-in-Chief." How all this storm in a teapot ended does not appear, but pressure was put on Lord Teviot to resign his command in Scotland and he was succeeded as Commander-in-Chief by Major-General the Honourable George Ramsay, Colonel of the Scots Foot Guards, 1 February, 1700. And in the following year the Earl of Argyll was created a Duke.

We now come to the last chapter of Slezer's life. On the 25 August, 1702, Queen Anne renewed his commission as "Captain of the Train of Artillery in Scotland" but he soon afterwards lost the accompanying post of "Surveyor of Stores and Magazines." In 1705 he brought out his "Case" which there is every reason to believe is not exaggerated. Slezer's biographer (Dr. Jamieson) states that¹ :—

"Slezer was not less unfortunate with respect to his claims in his professional line, than as to those which he made as an author; for he states in his *Case* that although his commission as Captain of Artillery in 1690 expressly bore that he should have 12s. per diem, yet by the establishment in the year 1693 this was reduced one-third; that although in his Majesty's letter, Anno. 1695, this defalcation was said to be merely the consequence of a mistake and a mandate was issued that he should not only thenceforth receive the full-pay, but that the arrears should be paid up, yet after the receipt of this for two or three years he had been subjected to the same reduction by a similar mistake; that although honoured with a new commission from Queen Anne as captain and also surveyor of the public magazines in which he was allowed the original pay he had never 'received any benefit from her Royal intentions;' that he was the only officer in the Artillery, or in any other department of the Service, who had met with so hard a fate 'for what reason he would not take upon him to judge,' and that matters continued on this same foot as long 'as he was upon the Scotch Establishment.'"

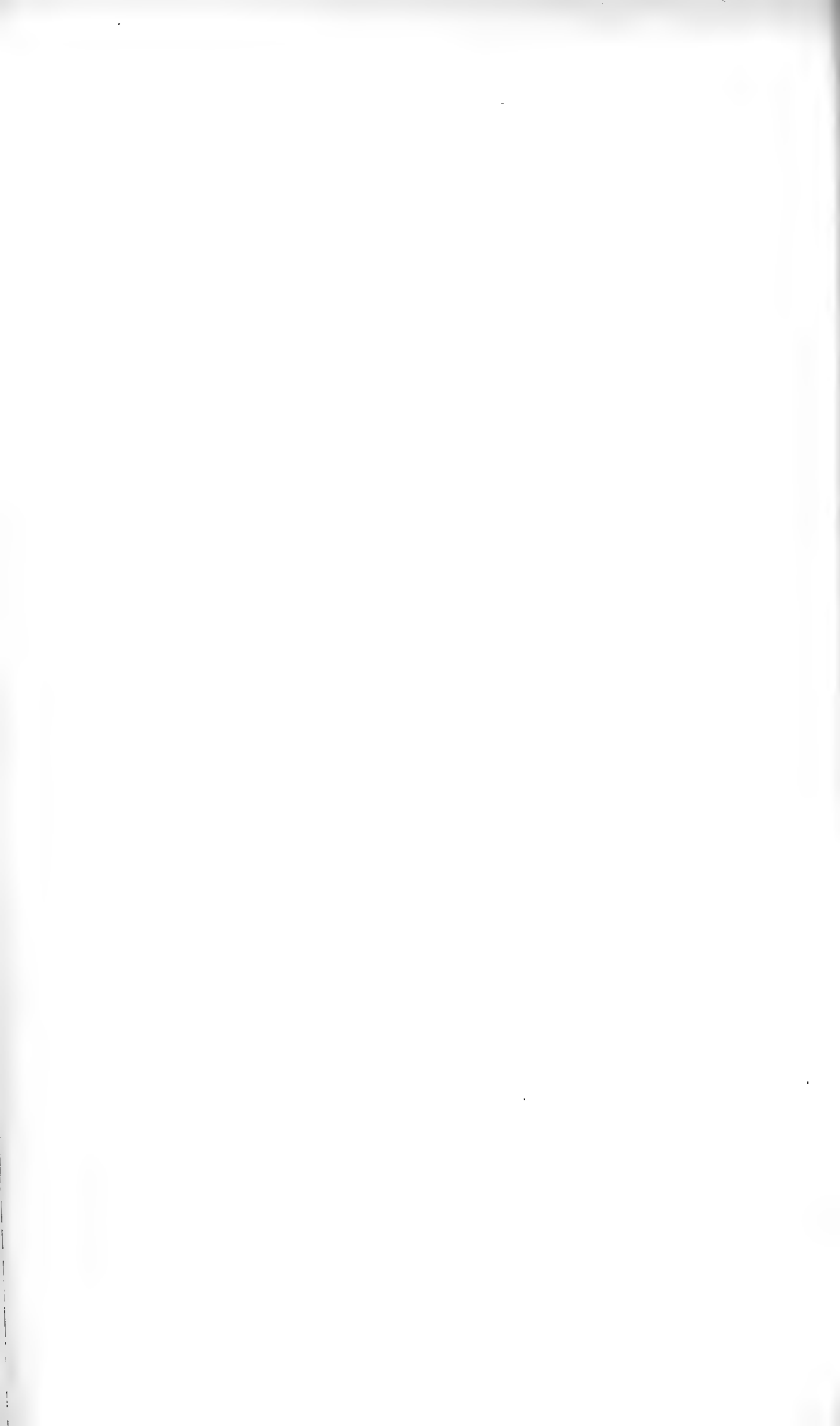
One of the debts which Slezer could not meet was for clothing

¹ Preface to *Theatrum Scotiae*, p. 10.

supplied to the Artillery Company. Dr. Jamieson points out that Slezer's generosity in respect of new clothing was ill-timed as he was then deeply in debt and a shelterer in the sanctuary of Holyrood House. Slezer's excuse for undertaking the above expense was that "he clothed his Company sooner than suffer them to go naked." It is also stated that Slezer's creditors, "tired with waiting for their money, prosecuted him for each separate debt and these, by a decree of the Court of Sessions, he was obliged to pay interest on for 10 or 12 years and also the costs of each creditor who brought an action." When the Artillery Company in Scotland was put on the English Establishment, in January 1708, the unfortunate Slezer once more appealed for justice and brought out his "Stated Case" in which he speaks of himself as "Captain of the Artillery Company in Scotland and *late* Surveyor of the Public Magazines," All his wrongs were recapitulated and put in print. But justice is proverbially blind and it was not until the author of *Theatrum Scotiæ* had been long in his unknown grave that his *magnum opus* received the public attention this work undoubtedly merited. The despairing author left Scotland for ever and where he spent his last few years is not known but we know the evening of his life must have been a miserable one:—

"They live too long who happiness outlive."

Captain John Slezer is believed to have died in June 1714, which was just eighteen months before that splendid veteran Colonel Albert Borgard was sent to Scotland with a Train of Artillery and who, on taking over the command of the Scotch Train found the latter "in such confusion as cannot be expressed." Truly John Slezer was avenged for the reduction of the North British Train was decided on the same year. By his wife (*née* Straiton) Slezer left two surviving sons of whom nothing is known, but it is not improbable that Captain John *Slessor* who served in the Royal Irish Artillery 1794—1801 and was afterwards Major in 35th Foot, was a descendant.



DIARY

OF

LIEUTENANT W. SWABEY, R.H.A., IN THE PENINSULA.

EDITED BY
COLONEL F. A. WHINYATES, *late* R.H.A.

(Continued from p. 535, No. 11, Vol. XXII.).

PART III.

CHAPTER III.

Opening of the Campaign of 1813. Passage of the Douro. Action at Salamanca. "F" troop R.H.A. joins the army. Passage of the Esla. "E" troop joins the Hussar Brigade. Action at Morales de Toro. Smart affair at Cellada del Camino.

I know not how to account for such a long vacuum as two months in my journal. When nothing is to be recorded the presumption is that time has been misspent. How far I plead guilty to this imputation, perhaps, I shall not own; be that as it may, there are some recollections and I own attachments which in this vacancy of incident have not been disregarded or unthought of.

Though idle with his pen, Lieutenant Swabey and the other officers had not been neglectful of the welfare of the troop, as is apparent from the following written by Major Gardiner, April 29th, 1813, from Mello, to the D.-A.-G., R.A., Major-General Macleod.—(F.A.W.)

"Since I quitted the 1st Division I have been constantly and most anxiously employed. You will hear from everybody what "E" troop was:—I joined it¹ at a time when from its dismantled state, Downman considered it necessary to recommend a reduction in its number of guns, and its name was established as being incapable of taking the field. At that time it was supposed the army could break up from its cantonments sooner than it has done, and many of the stores necessary to complete its refit I had to procure from Lisbon. I never was more unhappy at the prospect before me; however, my good fortune did not leave me even here, and the exertions of Captain Dyneley, Lieutenants Newland and Swabey have enabled me to retrieve everything. I still

¹ In March.

want a few men, but in other respects 'E' troop will yield to none in taking the field, and when we have had a little more time will surpass many. We shall move forward not merely in an efficient state, but perfectly to my satisfaction. Our horses are in beautiful condition, and our appointments of every description entirely new and complete."¹

14th May.—The long wished for and long expected march took place this morning, and we may say we have not started unprovided. Our horses and appointments are completed, the prospect bright of returning home and everything looks cheerily and well. To be sure, as far as incessant rain went during our march to Cortica, the outset was unpropitious. The perch of one of my waggons too broke when hardly out of Mello, but was replaced with great expedition. We did not reach our destination till 4 o'clock, and a horrid one it was.

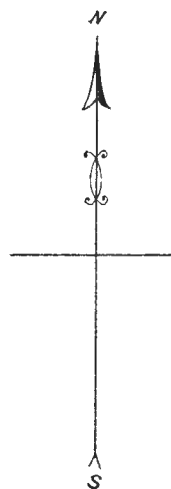
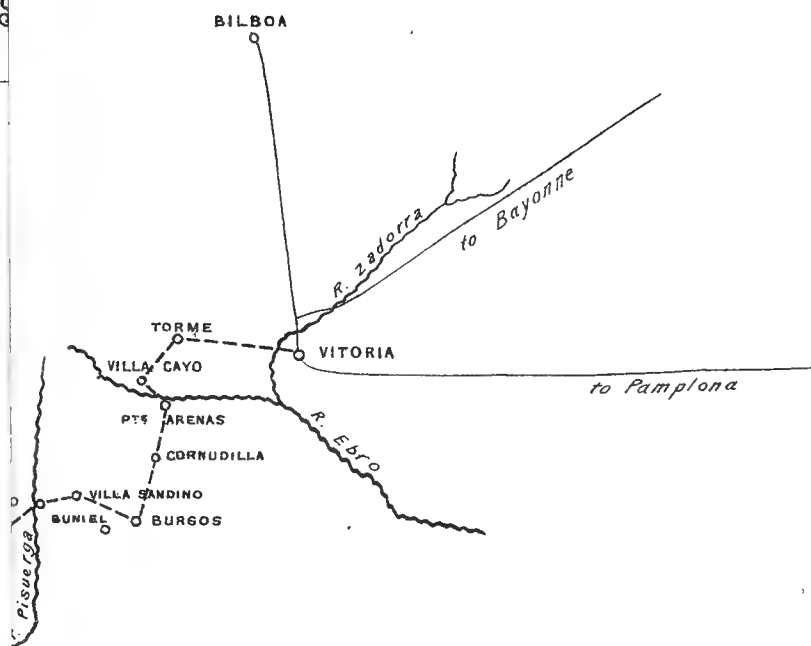
15th May.—Marched at 5 o'clock still in the rain for Trancoso, the road steep and hardly passable, it runs through Celorico, and crosses the Mondego by the bridge called Baracal. As is often the case the natural beauties of the country increased the difficulties of our march, and when I saw my fine fat horses strike on the hill my heart sank with despair. I had thought, as I said, that this year our horses and our men would be superior to all obstacles; but think what I might, we did not get to Trancoso till near dark. Trancoso is a walled town and is considered as belonging to the chain of defences that are linked together by Pinhel, Almeida, Guarda, Castel Branco, Castel Rodrigo, etc., the position is formidable, the place itself of no military importance, and much destroyed, and altogether a vile nest of more vile Portuguese.

16th May.—The sun at length appearing, we were once more cheered by a clear sky after a full month's incessant rain. Marching at 4 a.m. we got to Marialva by a bad road, though it is to be noticed that through the stupidity of our guide, we chose a worse one than we might have done. In Marialva we put up our horses, having preference given us in point of cover; the infantry encamped. This place is one of the most complete Moorish towns I have met with; it has a castle of the most perfect architecture and in high preservation.

17th May.—At 4 o'clock we marched by a terribly steep ascent to Villa Nova de Fascoa, a tolerable town and distant only 5 miles from the Douro. The vineyards in its neighbourhood produce the best Oporto wine, as well as a prospect pleasing to the eye.

18th May.—At 4 o'clock we marched down to the passage of the Douro, the descent is adorned by various beauties of prospect and fertility. On getting to the passage, my long formed ideas of the campaign were quite confirmed. Instead of building a bridge for which there was every material at hand, we were passed over in a wretched ferry-boat, which operation took three hours; in this there was no preparation by which the French could the least anticipate our movement. As Lord Wellington has not yet made any show or moved any

¹ For this document and some others I am indebted to the kindness of General Lynedoch Gardiner, C.B., R.H.A., son of the writer.—(F.A.W.)

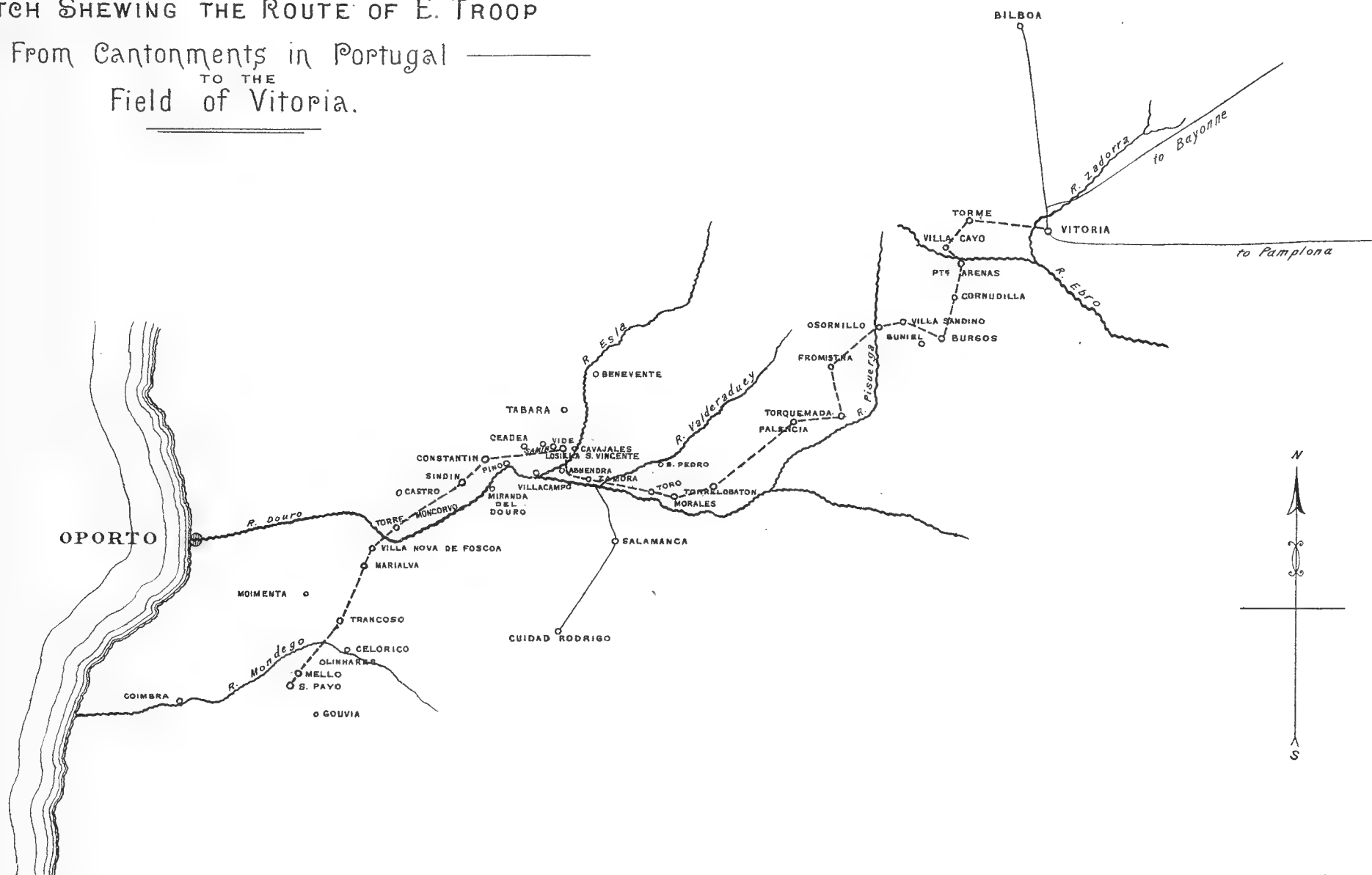


MAP IV.

SKETCH SHEWING THE ROUTE OF E. TROOP

From Cantonments in Portugal

TO THE
Field of Vitoria.





troops on the Salamanca road, I should not be surprised if we got unheard of to the rear of the enemy by crossing the Douro at this point; 10,000 men for the defence of its passage as well as their works at Zamora and Toro will thus be rendered useless. We may even march on northward without attacking Burgos. These ideas give me great pleasure, as the undertaking of so bold a measure proves us to be stronger than the enemy, and I now look forward to a happy and no very distant conclusion of the war. At the passage is a redoubt which prevented the passing of the French at that point. The ascent from the river is a frightful undertaking for artillery, being long and steep; our men gave infinite satisfaction by the active way in which they embarked and disembarked their carriages and horses; but we met with an unfortunate accident with a gun and ammunition waggon, which after being pulled by hand a great way up the wharf, broke away from the men and were considerably injured. Six wheels, thirty-six felloes and spokes had to be replaced; fortunately we halted at Torre de Moncorvo, and the damage was repaired. The ascent from the Douro is the most tremendous ever encountered by artillery.

19th May.—A vulgar fellow named Lieutenant Murphy of the 7th Portuguese Regiment in an unmilitary manner demanded Newland's quarter, and on Newland's remonstrating, ordered some Portuguese to charge into the house, they fixed their bayonets, but seeing we stood in the door, the men had the respect not to oppose us. Newland¹ told the man that he was a vulgar, ill-bred fellow, and as that did not affect him, put him under arrest, whilst I to be sure did not spare him. It was only by writing an apology that he escaped being broke.

At Moncorvo there is a Moorish castle and it is on what is called the Moresco or Moorish Road, but the people only know its name and cannot tell why it is so called.

20th May.—Marched at 4 o'clock to Fornos, a small village only 9 leagues from Salamanca, as the crow flies, but the crow is the only two-legged animal that can cross the Douro, so that I hope the French will gain no intelligence. The people in this town speak a mixture of Portuguese and Spanish; the French were never with them, but the dirt and backwardness of manner is not the less a characteristic of their Portuguese origin. I should mention that the current where we passed the Douro is so rapid that communication with Oporto only

¹ Lieutenant R. Newland (Kane's List No. 1229), remained with "E" troop to the end of the war, he was present at the battles of Salamanca, Vitoria, Orthes, and Toulouse, as well as other minor engagements. Captain Newland served in the campaign of 1815, and was engaged in the retreat from Quatre Bras and at the battle of Waterloo. Medal, and Peninsula medal with four clasps. Soon after the general peace in 1815, he went on half-pay, retired in 1832, and settled at Kempston near Bedford, in the neighbourhood of his old comrade and friend. They both hunted regularly with the Oakley hounds, and in the March number of *Bailey's Magazine* for 1871, we find the following:—"Captain Newland, an old Waterloo man, who afterwards lived at Kempston was very popular, and knew more about hunting than most men. Billy Swabey, another Waterloo hero, must not be forgotten. He lived at Clifton Hall, and was a regular attendant in the field. He had first-rate horses, and his saddle flaps were always cut square at the bottom. He was in the artillery with Captain Newland, and it is said when they were both at their guns during the battle, they saw a cannon ball coming directly in Swabey's way, and Newland called out 'Good-bye, Billy, you're done,' but Swabey saw it in time, ducked his head, and burst out laughing." Captain Newland, who was a J.P. and served as High Sheriff for Bedfordshire, died July 12th, 1858.

takes two days, whereas supplies from thence are frequently a fortnight reaching Villa Nova.

21st May.—Marched at 3 o'clock and arrived early at Villa Della, where the roads cease to be bad and our horses will begin to recover. In this day's march there was both iron ore and coal to be picked up.

22nd May.—Our route was to Sindin, but we found means to go to Duas Jgrejas, a place better suited to our purposes of foraging and getting away from the division. Hearing that the road to Miranda was very difficult, after dinner I rode to that place to ask for instructions from General Graham. Never having seen the place before, it must not be wondered at that in the dark I could scarcely find my way back; I left it entirely to my country horse who took me up to the stable door. It not being our first intention to march to Duas Jgrejas all the baggage except my own strayed to Villa Cham, and some of it did not find its way home till 11 o'clock.

23rd May.—Marched with instructions to halt in the neighbourhood of Malhadas, but to avoid the society of our friends the infantry, we proceeded to Constantin, two leagues in front of the rest of the army, where we got well put up.

24th May.—Some doubt existing as to the safety of our being so far in advance; Gardiner, by General Graham's consent, volunteered my services last night to explore the front to gain information, and likewise to ascertain the position of the Spanish cavalry with whom there had been no communication. I accordingly started at 5 o'clock in the morning and traversing 10 leagues of the front returned by 12 having been enabled through the civilities and assistance of the Spaniards to obtain the necessary information.

25th May.—Wrote my report to General Graham stating where I had been, viz. to Ceadea, Saneir, Vide, Losilla, Carvajales, and also that the Count de Penne Villemur was at Alcauizas with 800 cavalry, and had posts on the left at Tabara and the right at Carvajales; that the French had no parties on our side the Esla; that some part of the Spanish cavalry had marched on Astorga to cover the advance of part of the Galician army; and enumerating the different fords as I was enabled to learn their names, from Benevente to where the Esla falls into the Douro. The principle ones are Abnendra, San Vicente, and San Pedro de las Acevas, besides others passable only by individuals; the former the Spaniards have endeavoured to render impassable by building a sort of stone wall along the middle of the stream; none of them appear to be very good. I likewise understood that the French left Benevente the day before yesterday. The Spaniards informed me that they had only 800 cavalry and infantry at Zamora by way of a corps of observation. The abandoning of this place by them is the first effect of our movement. The 6th division Pontoons, and the brigade of 18-pounders are now up; we expect the Portuguese cavalry, the brigade of hussars, and Webber-Smith's troop¹ immediately.

¹ "F" troop (now "D" Battery) R.H.A. which had arrived lately from England.

26th May.—Last night after making up my journal, an order came to me to meet Sir Thomas Graham at Castro, whither I immediately went taking with me only a man to look after my horse, as the note hinted that as small a party as possible was to be seen. I reached Castro just before dark, where I found Mr. Pitts¹ of the Royal Engineers. Soon after came General Graham accompanied only by Colonel De Lancey,² Quarter-Master-General, and one hussar. After drinking tea we separated for the night, and it fell to my lot to have no decent place to lie down in. I did indeed find some blankets but my good friends the fleas did not allow me much rest. I slept in my clothes, and at day-light we assembled for our expedition, the object of which was to find a place to throw a bridge across the Douro to ensure support by communication with Lord Wellington. It was 5 o'clock when we started at a full gallop, as is the custom of Sir Thomas Graham. As he had fresh horses, three at different points, I only one, Colonel De Lancey two, and Pitts being only moderately mounted, we were soon left in the lurch; whether the General is mad or blind I have not decided; it required one of these imperfections to carry him in cold blood over the rocks and precipices. I should as soon have thought of riding from Dover to Calais; nevertheless I followed him; yet with all this the General is not quick, for want of foresight he loses much time and distance in galloping blindly on. We traversed the rocky bank of the Douro from Pino to El Bano de Villa Campo, never was there so inaccessible a river; at very few places was it possible to get to its brink, much less to mount the other side. Many places were proposed and negatived by me and the Engineer. At length at Villa Campo we fixed on a spot, not indeed so good as might be wished, but one where it was not quite unreasonable to make the attempt.

This over, the General went home and sent me to enquire into the practicability of some fords on the Esla. I found no reason to alter my former report except by stating that the inhabitants, and not the French as I had thought, had destroyed the ford at Abnendra to prevent invasions from the opposite quarter. On the whole I decided that the Esla from Benevente downwards is only to be forded there or near Villa Beza at this time of the year. I saw a letter from Zamora stating that 3000 French had arrived, I concluded the rear-guard, because the letter stated their having destroyed the bridge. It likewise said that they were rejoicing on account of reported advantages gained over the Russians; this I take to be the defeat of Beauharnais.³ It is

¹ Lieutenant Pitts was killed in the affair at Tarbes on March 20th, 1814.

² Colonel Sir William De Lancey was Quarter-Master-General to the army in the Netherlands in 1815. He was killed at the battle of Waterloo.

³ Beauharnais tells the story of his defeat in an intercepted letter to Berthier, from Sassalie, November 8th, 1812.—(F.A.W.)

"During the retreat from Moscow, on November 7th, Beauharnais's corps was attacked with such fury by the Cossacks that a temporary dispersion took place, the silence of the French bulletins in regard to this affair is supplied by the Viceroy's letter in which he says, "Your highness will be surprised to find me still upon the Vop, but my situation is critical enough; whole trains of horses have perished in harness at once; yesterday 400 died, and to-day perhaps double that number—I must not conceal from your highness that sacrifices must be expected, and that these three days of suffering have so dispirited the soldier, that I believe him this moment very little capable of making any effort; numbers of men are dead with hunger and cold, and others in despair have suffered themselves to be taken by the enemy." *Quarterly Review*, No. 16, December 1812, p. 470.

an old saying in the military world that the French only once omitted firing salutes when they were defeated, and that was after the battle of Trafalgar where all their guns being taken they had none left to rejoice with.

27th May.—Not at all sorry to find a day of rest, I availed myself of the opportunity to write to England.

We heard to-day that Lord Wellington with the 2nd and light divisions, having pushed on the cavalry consisting of General Fane's brigade and Bean's¹ troop of Horse Artillery, overtook the enemy's rear-guard and killed and destroyed 300 of them.

From a Horse Artillery point of view this action is very noteworthy, illustrating the mobility of that arm and its effective co-operation with cavalry in the Peninsula. As Part II. of this diary deals almost exclusively with "D" troop, we cannot fail to read with interest its experiences on this occasion. Both Lieut.-Colonel Alexander Dickson and Major Augustus Frazer wrote accounts of the affair, the substance of which is as follows.—(F.A.W.)

On May 26th, Lord Wellington moved forward towards Salamanca, on approaching which place infantry columns of the enemy were seen halted at each side of the town, a part of the cavalry being however on the left bank of the river to observe the movements of the allies. As the latter advanced the cavalry retired across the bridge into Salamanca, but the infantry remained for a considerable time unmoved. In the meanwhile Sir Rowland Hill's Cavalry and Captain Bean's troop of Horse Artillery were ordered to push for the ford of Santa Martha, a little above the town. As soon as the French saw these troops approach the river they moved off their whole force, which included about 2500 infantry, two or three squadrons, and three or four guns. General Fane who was in command of Sir Rowland Hill's Cavalry passed the river in a moment. Owing to the ravines and intricacies of the ground near the river, which obliged the Horse Artillery to make a detour, it was not possible to bring the guns into play for some time, during which the enemy retired by squares along the Arivolo road towards Aldea Langua. At the distance of a league and a half from the city however the guns of "D" troop came into action and fired with effect, every shot going through the ranks of the unfortunate enemy, who retired with extreme rapidity but in great order. The pursuit was continued for five or six miles, the Horse Artillery cannonading them from every available point although the interposition of the cavalry between the enemy and the guns at times masked their fire. The loss of the enemy was about 400 men killed, wounded, and prisoners,

¹ On the death of Captain Lefebure, the command of "D" troop was given to Captain George Bean, known in the Regiment as "Handsome George," he was killed in command of it at Waterloo.—(F.A.W.)

of whom 100 alone were victims to the artillery fire, indeed few fell in any other way, and so shaken were the squares by it that had the regiments moving on the flanks pushed on, the whole force might have been captured.

Lieutenant Brereton, on this occasion a subaltern in "D" troop, writing in 1840, says, "on this day a remarkable occurrence took place, which was often afterwards adverted to by Lord Wellington and Lord Fitzroy Somerset; sixteen men were killed by one six-pounder shot, they fell in a line perpendicular to our position, each man lying partly over another."¹

28th May.—All the army except ourselves moved to Brandilanes and bivouacked. We passed them and went to Fonfria where we got cover for our nags but encamped ourselves. Webber Smith's² troop having reached the army, I rode back two leagues to see my old friend Edwardes; our meeting was enviable.

29th May.—Marched to Carvajales where by dint of perseverance we got in our horses, the rest of the army still being in camp.

30th May.—Lord Wellington and his staff having crossed a ferry at Miranda del Douro, suddenly appeared amongst us, the influence of his presence seemed immediately to give life to every individual, and nothing was talked of but crossing the Esla. Accordingly in the morning Gardiner and I rode a league to see the road and the ford of Abnendra. We found the current so rapid that I gave up entirely the idea of passing and returned with the conviction of its impossibility. I then galloped over to dine with Webber Smith and was not a little annoyed to be present when he received an order to join and be attached to the hussar brigade, as I had been setting my wits to work to put our troop in that situation and had induced Gardiner to make application by letter for that purpose.

¹ Two other instances of the destructive power of round shot are worth quoting. Brevet-Major Stretton, 40th Regiment, writing of Waterloo, says, "towards the evening whilst the regiment was in open column, a round shot from the enemy took off the head of Captain Fisher near me, and striking his company on the left flank, put *hors de combat* more than 25 men. This was the most destructive shot I ever witnessed during a long period of service." Waterloo letters, p. 401.

After the battle of Alma, "near the bivouac of the light division, there were many dead, among them a remarkable group of fourteen or fifteen men who had been killed in retreating by one cannon shot from the French artillery. The shot had passed through their bodies near the waist, as if a rank of men had just turned and when in perfect covering had been caught in the back in that position by the shot, for they all lay partly one over the other with faces downward." History "C" troop, p. 107.

Apropos to these incidents; there are some who will remember how in old days the late General Sir John Bloomfield, G.C.B., of Peninsular and Waterloo experience, when descanting on events of "farty years ago," as he was fond at times of doing, was wont to emphasize the opinion that *there is nothing like a round shot*; in plain truth in the days of defective shells and unreliable fuzes there was more soundness in this view than the young and inexperienced hands who listened to the old soldier were perhaps willing to admit.—(F.A.W.)

² Captain James Webber Smith (Kane's List No. 877), served at the capture of Minorca, 1798. At the siege of Malta, 1800. At the defence of Porto Ferrajo, 1802. In the expedition to Walcheren and at the siege of Flushing, 1809.

In 1813, he embarked when in command of "F" troop for the Peninsula, and served with it to the end of the war. He was present at the battles of Vitoria, Nive, Nivelles, the passage of the Bidassoa, and the siege of St. Sebastian.

Lieut.-Colonel Webber Smith commanded "F" troop at Waterloo. He received for his services the gold cross and 1 clasp, the silver medal and 2 clasps, and the C.B. Lieut.-General Webber Smith died in 1853.

31st May.—The army assembled at day-light on the banks of the river to pass the ford of Abnendra; having the day before seen the enemy's vedettes on the opposite side, opposition was expected. Arrangements were therefore made to force the way over; whether the enemy had intended to dispute the passage of the Esla I know not, but of this I am certain, that they deemed the ford of Abnendra impracticable, not only from its depth, the rapidity of the current, and the badness of the bottom, but from its being commanded by heights on which a few guns placed would effectually stop a whole army. The passage being up the stream and very broad each individual would be at least a quarter of an hour passing. The advance, consisting of the 51st light infantry regiment and the brigade of hussars, dashed in and got over with the loss of a few drowned. By their rapidity the picket of cavalry, which was all the force the enemy had, were taken prisoners, as it was never conceived that such an attempt would be made. It soon became our turn to pass. I never saw anything so truly dangerous; we did indeed by great care get over safely with the exception of one of Newland's baggage-mules which was carried off its legs down the stream and shamefully abandoned by his servant. At last it was brought up against an island, and seeing nobody would start I swam my horse there, and landing was enabled to hold the animal till some of the men took courage, came and finally rescued his things. We marched to Val de Perdices where for the first time we encamped, took off our harness and turned out our horses to graze. They were scarcely loose when an alarm of two regiments of the enemy's cavalry being given, we had to harness and turn out. It was a beautiful scramble.

1st June.—We crawled along the road with our infantry division lamenting our bad success in not being able to leave it till we got to the basin of the Valderaduey, a river which runs close to Zamora and there joins the Douro. We had scarcely drunk Lord Howe's¹ health when what should come but an order for us to join the Hussars.² All was life and we were soon put to, the troop to go to Fresno de la Ribeira to join the brigade, and I to go to Zamora and apply to the Commissary-General to let us take the mules attached for our transport. I spared neither spurs nor horse and flew to Zamora; it was not however till two hours after dark that I could find Sir R. Kennedy,³ and then he was a long time unwilling to accede to my wishes. I used every argument I could think of and at last succeeded in obtaining my request. It was then too late and too dark to undertake a road I had never before seen or heard of; in consequence I determined to remain all night with Harding.

¹ To commemorate his victory on June 1st, 1794, over the French fleet off Ushant.

² HEAD-QUARTERS,
ZAMORA, *1st June, 1813.*

Major Gardiner's troop of Horse Artillery will move this evening to Fresno Ribera and continue until further orders with the Brigade of Hussars. Lieut.-General the Earl of Dalhousie will be so good as to forward this order by Major Gardiner to the hussar brigade.

(Signed.)

GEORGE MURRAY,
Quarter-Master-General.

³ The Commissary-General.

Zamora is the best built and handsomest Spanish town I have seen except Madrid, it commands and defends the passage of the Douro, the bridge over which is now for a second time destroyed by the enemy. The town was illuminated and a ball given, and Lord Wellington was received with acclamations.

2nd June.—Started at day-light to rejoin the troop and the hussars, who marching by Toro had overtaken the enemy's rear-guard at Morales. Colonel Grant¹ who commands the brigade had by skilful and rapid manœuvring succeeded in making two hundred prisoners, and killing in proportion. Our loss was about 20 killed, wounded and missing, amongst the former, Lieutenant Cotton of the 10th. Captain Lloyd was wounded and taken prisoner, on which account he took his parole and was left behind. The pursuit, being checked by the French Horse Artillerys' taking up an advantageous position, was stopped. It was a great disappointment to me to be absent, but as our guns only fired five rounds, I was easily consoled by knowing the lasting and essential service my going to Zamora had been to the troop.

I shall now say a few words of triumph about being posted to the cavalry. It was Lord Wellington's own order on seeing the condition and good appearance of the troop, and caused great annoyance to Major Frazer and our numerous enemies in the corps, who after trying to break us up, had the mortification to see us arrive at superiority, while we had the satisfaction to know that in spite of all difficulties that superiority was owing to our own exertions. We received from Webber Smith a 9-pounder in place of a 6-pounder to make us a match for the French 8-pounders. Poor Webber Smith returned disappointed to take our place with the 7th division.

3rd June.—Marched to Pedrosa del Rey without hearing of the enemy, who, it appears, is satisfied with what he got yesterday. The troop was with difficulty got into quarters and we suffered considerable inconvenience from the inexperience of the hussars who do not understand the system of quartering troops.

4th June.—Marched to Torrelobaton where we got comfortably into quarters with beautiful forage.

5th June.—Marched to Peñaflov. Not that Peñaflov which was the scene of Gil Blas's adventure, but an ugly town on a hill, just quitted by the French rear-guard. Ugly as it was, we did not enter it, but lay all night in the rain thinking of little else than the state of our fat horses.

6th June.—Marched to a terrible cold and bleak bivouac with continued rain. We all looked very darkly at each other, not only because we trembled at the idea of our horses losing their condition, but also lest the march by road should be impeded, and Lord Wellington's rapid movements be at a standstill.

7th June.—A very wet and unfavourable day. We marched through Palencia, the cheers and congratulations we met with made us for a

¹ Colonel Colquhoun Grant's brigade was composed of the 10th, 15th, and 18th Hussars. He commanded a light cavalry brigade at Waterloo.

while forget its unseasonable influence. Palencia is an extensive and well built city, close to it passes the great canal that runs from the Ebro, crosses the Douro near Simancas and terminates at Segovia. It is precisely on the plan of our inland navigation, and I examined some of the locks which I found constructed like ours, in a high state of perfection, and uninjured by the times. The boats are probably burnt, at any rate, the canal is in disuse. It is called Canal de Castilla, runs from Reynosa close to the rise of the Ebro, passes near Burgos and through Valladolid to Segovia, and is fed by the various streams of the Douro and the Ebro. There are few manufactures about it; the silk of Segovia, and a few paper frames at Palencia form the principal *matériel* of traffic. From the rise of the Ebro the land carriage to Santander is not more than 10 leagues.

Halted at Villa Lobau and were tolerably covered as to horses, the officers in tents.

8th June.—It was expected that the enemy might take up a position at Torquemada. Whatever might be his intentions, Lord Wellington passed columns in the direction of Amusco to our left, General Hill's corps only marching by Torquemada; this movement obliged the French to abandon the position.

Our fate led us to a place called Tamara which as we did not march till 11 o'clock, we found filled with the 4th and light divisions, so that though it rained incessantly few horses got covered.

N.B.—The hussars committed great excesses in Villa Lobau, and before it marched, Colonel Grant severely punished three of them in presence of the brigade. He paid our troop the compliment of excusing its attendance by which I felt flattered, but I was, as I always have been, convinced that an appeal to the pride of a soldier who has been two years on service meets little good result.

9th June.—To-day we crossed the river Carrion and the canal and arrived at Fromistra in a terrible wet plight through deep roads. Our horses unavoidably suffer from such continued marching and wet weather, we got them covered and they got plenty of green barley.

10th June.—Passed the Pisuerga at Osornillo. This river is not to be forded in this direction, but the passages over it are so many that the French had not thought it worth while to destroy the bridge. We halted at Villa Sandino after five leagues of wet and bad marching. I pitched my tent, the quarters not being capable of accommodating everybody.

11th June.—This morning all our spirits were gay at the change that had taken place in the weather, the principal enemy we had to fear; had it continued Lord Wellington's plan of turning and marching on the enemy's flanks must inevitably have failed. The army closed up on Burgos, after only three miles march we halted and got into capital quarters at Castrilla de la Murcia; the enemy two leagues from us at Hornillos; to-morrow or perhaps the day after the intention in regard to Burgos will be seen.

12th June.—This day's operations were perhaps as good a military

lesson as was ever afforded. About 12,000 infantry and a few of the enemy's cavalry had taken post on the heights covering the Burgos high road about Buniel. To cover and conceal his real intention of marching on the enemy's right flank Lord Wellington, though he moved the whole army up to that point, showed only some cavalry. The operations began by a little manœuvring with the Hussar Brigade. The 15th Hussars supported by Newland's two guns, with which both Dyneley¹ and Gardiner went off, advanced against the French cavalry. I was left with the 10th and 18th, who conjointly with the heavy cavalry and General Anson's brigade, tried to outflank their infantry, Lord Wellington and Sir Thomas Graham superintending. My four guns were immediately called on, and I advanced in front of our troops, and cannonaded the enemy's columns as they returned to the high road. I think there never was such an opportunity for the movements of Horse Artillery. I followed them on their flank as they retired, and seven different times came into action, twice within two hundred yards, when the enemy with the greatest firmness and intrepidity formed hollow squares and received our fire very steadily giving me two volleys of musquetry which fortunately, though it could hardly have been expected, passed over us without injury. In order to determine the necessary changes in our position I was several times obliged to gallop close up to them, when many of their men fell out of the ranks and took steady aim at me, but I kept in motion and was consequently safe. As soon as they got down the hills, losing a great many men on the way, one squadron and two Horse Artillery guns endeavoured to cover their rear, these were charged by a squadron of the 14th and one of the 3rd Dragoons who took one of the guns.

All this time the staff stood by me, but I was permitted to choose my own ground and was in no way interfered with. Owing to the enemy being much below us, and the ground being wet, our shot did not rise and consequently did not take the effect I could have wished. Lord Wellington sent me a message to go down into the high road, where indeed I should have been glad to be, but it was then too late and on my representation it was left to my discretion.²

Gardiner in the meantime had done much execution, and the enemy being now out of my range, he came to me to move. The ground was very bad, and in doing so one of my guns upset and broke the trail. I was getting it replaced and the gun mounted on the spare wheel-carriage³ when General Alten galloped up and requested me to en-

¹ 2nd Captain Thomas Dyneley (Kane's List No. 1114) served in the campaign in Italy under Sir John Craig in 1805; and that in Calabria in 1808, under Sir John Stewart; battle of Maida and siege of Scylla.

In the Peninsula with "E" troop from July 1811 to November 1813, was present at the sieges of Ciudad Rodrigo (wounded), Forts of Salamanca (wounded); at the battles of Salamanca, Vitoria, and the Pyrenees, and at the affairs of heights of Christoval, bridge of Simancas, Majalahonda, Morales, and San Muñoz.

He accompanied the troop to the Netherlands in 1815, and was present in the retreat from Quatre Bras and at Waterloo. Peninsula medal and 5 clasps, medal and C.B. for Waterloo. Lieut.-General Dyneley, C.B. died in London in 1860.

² "There was a smart cavalry affair yesterday at Cellada del Camino. We took an officer, some prisoners, and a gun." Letters of Sir A. S. Frazer, K.C.B., p. 143. See Lord Wellington's despatch June 13th, 1813, Vol. X., p. 433.

³ The spare wheel-carriage, which was also a spare gun-carriage, carried three spare wheels.

deavour to get off the French gun we had taken as it was threatened. I took two pairs of horses and though it had no limber got it off to the rear and delivered it over to General Hill's division.¹

Knowing where the troop was to halt I made for that point and got into camp at Isar quite wet, it having rained all day. The horses got a bad night; our men covered with tents fared better.

13th June.—My 23rd year closed this hated day, I am sorry to say it brought with it many moral and unpleasant reflexions; how little wiser, how little better, and little advanced in life I am God only knows. I am no nearer the best and only object of all my wishes, the only progress I have made is in my age. Philosophy may be a source of consolation but insensibility is so inseparable from it that I am not ashamed to confess that it has no charms for me; but adieu to melancholy reflections.

Lord Wellington having made a demonstration on the high road yesterday, and perhaps having intended to invest Burgos, was with everyone else surprised and delighted at hearing at 7 o'clock this morning a heavy explosion which soon turned out to be Burgos, ill-fated Burgos, flying up in the air. Here ended the curse of the English army, the obstacle to all our designs. The army was immediately put in motion and away we went on the enemy's flanks still keeping General Hill's corps in their rear to blind them. Night brought us to a wet camp in a ploughed field near Tovar.

It is interesting here to learn from Wellington's own words how he was influenced by the destruction of Burgos.—(F.A.W.)

"When I advanced upon Burgos the second time, and had taken my measures for driving back all the French posts and attacking the place, I was very much surprised by a loud explosion; they had blown up Burgos. . . . When I heard and saw the explosion (for I was within a few miles and the effect was tremendous) I made a sudden resolution forthwith—instantly to cross the Ebro, and endeavour to push the French to the Pyrenees. We had heard of the battles of Lutzen and Bautzen and of the armistice, and the affairs of the allies looked very ill." "Croker Papers," Vol. II., p. 309.

¹ In the days when short ranges exposed Horse Artillery to musketry fire as at Cellada del Camino, and to close fighting with cavalry as at Albuera, rapidity of movement and celerity in serving the gun were imperative. In his able work on the "Achievements of Field Artillery," Major May justly says:—"It was not through mere wantonness or love of theatrical display that smartness was cultivated in the old troops, nor is it open to us less fortunate in experience to deride methods that were the outcome of years of continuous active service, and which strove for and obtained efficiency solid and substantial." Apropos to which we may remark that during the long peace which intervened between the Peninsular and Crimean wars, those who sneered and cavilled at the drill and movements of the Horse Artillery and called them "Woolwich Gladiators" * did so from lack of experience and knowledge of the conditions of service that had resulted in what they witnessed. Mobility and quickness in serving the gun must still be the characteristic of Horse Artillery, and the introduction of a lighter gun than has been in use of late years will it is hoped enable that arm to resume its touch with the cavalry which since the craze for long ranges and accurate shooting it has practically lost.—(F.A.W.)

* It is curious that the author of this epithet in after years obtained appointment to that branch of the regiment which he at one time so vehemently assailed.—(F.A.W.)

14th June.—We started and marched through an unfriendly mountainous country to Cornudilla. The army being so long on the march is in great want of bread, but "*Aut Cæsar aut Nullus*" being for the first time Lord Wellington's motto, on we must go and push the French to the rear. Sir Thomas Graham passed the Ebro at San Martin.

15th June.—We marched to the Ebro descending to it by a causeway 5 miles in length made between the clefts of stupendous rocks. Lord Wellington saw us descend with great anxiety for it was not quite certain whether artillery could pass. The descent was very sudden and steep, the road very roughly paved, not very wide, and in many places with frightful precipices at the sides. It was the most nervous thing I ever did; we had the good fortune to get down without injury though a slip would have been fatal. The pass is called the Puente Arenas. After crossing the river we wound about its course by a most beautiful but frightful road cut in the side of the rock; perpendicular mountains covered and clothed on all sides with trees and shrubs hanging over a narrow smiling valley full of fertility. I have read many flowery descriptions of Alpine scenery, yet never formed a conception of natural beauty in so fair, or it would be equally applicable to say, in so rugged a form. All I have seen and admired in Portugal was nothing to this. The French passed this road when they attacked Reynosa, and we found it had been obstructed by walls built across it. The rock was so hard that I conclude the usual method of cutting ditches across, had been impracticable. Night brought us without accident to a camp at Villarcayo.

16th June.—Passing through Medina, a very good town, we arrived at Torme where I dined with the 3rd Dragoons, and heard some account of the effect of our fire on the 12th. From all I could collect I am certain now of my guns having killed thirty on the road, and many more above it, but no one afterwards went over that ground. Gardiner's guns also did great havoc, and in Burgos were found sixty wounded with cannon shot and shrapnel shells, of which we made great use.

17th June.—Marched to a camp near Santa de Llorente; again a wet night.

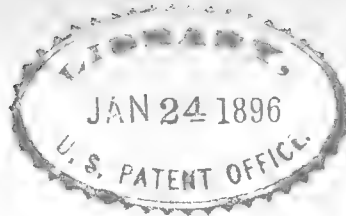
18th June.—The army marched with some caution this morning, the enemy with 7000 men having possession of a pass on the Vitoria road. As the country was not favourable for cavalry operations, we took no further part in dispossessing them than in looking on. The light division turned the flanks, General Anson's cavalry with Lawson's¹ and Ramsay's guns drove them; there was much skirmishing and the enemy at length retired in confusion. The light division took 250 prisoners, a considerable number of oxen and a great deal of baggage. I calculate the enemy's loss since we marched at 1500 men, our own about 100 or less, and we have only 500 sick. In consequence of the wet weather we have unfortunately experienced, Lord Wellington's plan of carrying

¹ Captain R. Lawson. (Kane's List No. 943).

camp equipage¹ has turned out better than was supposed, and certainly saved thousands. The army having advanced 20 days without halting begins to experience the want of bread in a serious degree; corn we have not seen for 4 days.

¹ It was the first year tents, 3 per company, were supplied to shelter the infantry in their bivouacs.—(F.A.W.)

(To be continued).



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PRÉCIS
AND
TRANSLATION.

“RUSSIAN ARTILLERY JOURNAL.”

THE MILITARY TRAINING OF FIELD ARTILLERY.

PRÉCIS BY

MAJOR E. A. LAMBART, R.A.

(Continued from No. 11, Vol. XXI).

Instruction in Manœuvre.—General Principles.

Exercises in manœuvre may be divided into two parts, viz., simple exercises, *i.e.* drill movements, and exercises connected with fire action.

The former, directed to instruction in drill, may be regarded as regulation exercises, such as are included in sub-division, section, battery and brigade-division drill. The latter consist of movements connected with forming “fighting” formations from “order of march” formations, and the solution of tactical problems with reference to ground, &c. As regards drill, the more clearly and simply the duties of the different grades of commanders are laid down, the easier will be the instruction of all ranks.

As described in former chapters, this simplification is best arrived at by the principle that every commander, from the brigade-division commander down to Nos. 1, is the *guide* of his command, which moves as it were independently, directing itself and dressing by him. As each unit, sub-division, section and battery completes its instruction as such, it is ready to be worked into the one above it; the only individual who requires fresh instruction being the commander. Thus when we pass from the smallest drill unit, the sub-division, to the largest ones, we merely bring together a number of instructions of individuals in each of which the instruction is reduced to that of the commander of the next smaller unit.

From what has been said we may deduce these principles on which to base the instruction of artillery, viz. :—

- (i.) A sharp line of distinction between drill and manœuvre.
- (ii.) A broad use of individual instruction and personal responsibility.
- (iii.) Alternation of simple drills with combined manœuvre.
- (iv.) Practical examples, *i.e.*, tactical problems, &c.

The manœuvring of bodies of artillery, if the instruction is based on these principles, becomes very simple since the whole attention of commanders of sub-

ordinate units is directed not to the execution of geometrically exact movements, but to the simplest and quickest methods of leading their commands to their places in the new formation.

Note.—The article goes on to lay down elaborate details for the consecutive instructions of the different drill units, sub-divisions, sections and batteries. The two former of these contain nothing of interest to us, I think, nothing that is any improvement on our own system. It is suggested that much instruction may be given at times of the year when mounted drills outside barracks cannot be carried out, by means of *skeleton* drill on foot and mounted.

Skeleton Battery Drill.

The guns and wagons are represented by mounted men, the former by two or three men each if possible, so as to provide a horseholder for Nos. 1.

Very useful instruction can be given in this way to section commanders and Nos. 1 in keeping the proper intervals and distances, taking up positions for action, &c.

As the movements are naturally carried out more quickly than with horsed guns more instruction can be got through in the same time, and the battery commander has better opportunities of observing the mistakes made and correcting them.

Battery Drill.

The preliminary training of the battery as a whole should be carried out on the parade ground. It is here that it will be shown whether the preliminary instruction in sub-division and section drill, and of section commanders and Nos. 1 in skeleton battery drill has been thoroughly mastered. It is not recommended that much time should be devoted to purely parade movements, nor that a high degree of precision should be exacted in them. Work on the parade ground is better devoted to practising the more important manœuvres that are used in the field, such as the fighting formations and coming into action. Positions to be occupied should be marked out with flags, &c., and the section commander and Nos. 1 practised in bringing their guns accurately and squarely into action at the proper intervals, accustoming themselves to judge from a distance the points in the marked position they should make for. Better practice is gained if only one flank of the position be marked.

The real training of the battery for service, however, must be carried out beyond the precincts of the parade ground. Its most important feature is practice in coming into action from the line of march, with the reconnaissance of ground and position, &c. This preliminary reconnaissance must be most thoroughly carried out, with a view to profiting by all available cover for the advance of the battery and its concealment when in action. The instructing officer having decided on the ground to be worked over, and observed the approximate position for action, as well as the position of the imaginary or marked enemy, places at various points of the latter, officers or N.-C.O.'s told off as observers, who are provided with field-glasses and compasses. Their duty is to observe and note down everything connected with the advance of the battery under instruction that would have given information to the enemy in his position of an impending attack. In the battery itself notes are also kept of the times of its different operations, advance to the preliminary position, coming into action, &c. By means of these notes the instructing officer is able to ascertain how far the advance was concealed, and to point out faults in not taking advantage of cover, &c. Repeating exercises of this kind will give officers a true appreciation of the value of cover and cultivate in them the habit of quickly seizing on the best lines of, and formations for the advance.

Brigade-Division Drill.

Skeleton drill is not applicable to a brigade-division on the parade ground, but is an extremely useful form of exercise on manœuvring ground, and may be directed to the same objects and applied in the same manner as in the case of a single battery.

Parade ground exercises with horsed guns of a brigade-division should be devoted to obtaining uniformity of pace, practice in following the brigade-division commander in changes of direction, and to the formations of columns and lines as laid down in the drill-book. Advances into action on a marked position should also be practised, especial attention being paid to dressing and intervals in action. Brigade-division exercises on manœuvring ground are, as in the case of a single battery, to be principally devoted to movements into action from the line of march; and the same method of instruction and remedying faults should be adopted.

All exercises of batteries and brigade-divisions lose much of their value if the batteries are not practised at the same time in fire action, which is intimately connected with the supply and replenishment of ammunition, replacement of casualties, &c.

By lending horses to each other the batteries of a brigade-division may also be practised in working at full war strength, which is very important in view of the great difference between the peace and war establishment of a battery.

Conduct of Artillery Exercises in connection with Action.

The instructor formulates the general and special ideas, and himself takes the post of the next highest commander, such as commander of an advanced-guard, a division, or detached force.

An imaginary enemy as well as imaginary troops on the side of the batteries should always be indicated by the instructor, who gives directions on the following points:—

- 1.—The movements (imaginary) of the troops on both sides.
- 2.—Casualties among commanders, as well as among men and horses of the batteries.
- 3.—Damage (imaginary) to *matériel* in the batteries.
- 4.—The effect of the fire on the enemy.

Replenishment of Ammunition.

This is of the highest importance and must be most carefully practised in all its details.

In this connection it is highly desirable that a sufficient supply of drill projectiles to partially replace the service ammunition of at least one battery in a brigade-division should be kept up, to the extent of one box each of drill common shell and shrapnel per limber, and full *first-line* wagons.

It is very important that the second-line wagons should reach the fighting position before the whole of the first-line ammunition is expended. The battery commander has his hands too full to be able to keep note of the expenditure of ammunition, and the same is true of the section commanders. This duty should therefore be imposed on a superior N.-C. officer (quartermaster sergeant),¹ who should be in charge of the first-line wagons. His whole attention, after the battery is in action, should be devoted to noting the expenditure of ammunition, and at the proper moment he should inform the battery commander that the time has come to call up the second-line wagons.

The second-line wagons await in the nearest position, under cover, the moment when the first-line of wagons leave the fighting line. This happens as soon as the

¹ "Wachtmeister," "feld webel."—E.A.L.

last cartouche¹ of the kind of ammunition, which is being used, has been sent up to the guns. Immediately before this moment the teams are hooked into the first-line wagons which move at a trot to the position of the limbers, where the rounds remaining in them are collected in one or two boxes of the gun-limbers if any rounds have been taken out of them. The empty wagons are then refilled from the wagons sent up by the ammunition column. If the batteries are suddenly called on to move shortly before the time has come to call up the second-line wagons, they should take on with them the almost emptied first-line wagons, sending directions to the second-line to follow by the shortest road to the new position. On the other hand, if the batteries move when the second-line wagons have already been called up, the quartermaster-sergeants of each battery should take over and bring along the latter, sending back the almost empty first-line wagons to be refilled. If the fire has been carried on exclusively with one kind of ammunition, the first-line wagons, although not empty, should be sent to complete from the ammunition column. In positions at short ranges the guns are supplied direct from the limbers.

Replacement of Casualties in the Personnel.

This must also be practised in peace time. As soon as the batteries come into action the spare gun carriages approach to the nearest position under cover, bringing four bearers and the battery surgeons; the duty of the latter is to immediately remove from the proximity of the batteries the killed and wounded, to avoid the unfavourable moral effect of their presence on the remainder. Slightly wounded men, who are able to walk, after their wounds are dressed, are sent straight to the wagon échelons, and the remainder are removed by stretchers or on the empty ammunition wagons going to the rear. This should be practised in peace time by making use of tickets in the following form, which under the orders of the instructor, are pinned to the breasts of the men indicated.

Example:—No. 2 at No. 5 gun. "Wound by splinter in the right leg below the knee, three minutes after coming into action." The man indicated falls out, and according to the nature of his wound, either walks to the rear or is removed by the bearers.

It is a moot point whether casualties in the gun detachments should be replaced as soon as possible, or whether the guns should be worked with reduced detachments. Section commanders arrange for the performance of the duties by reduced numbers in the event of casualties, and the quartermaster-sergeant controls and arranges for the replacement of them from the limbers and wagon échelons, those belonging to the first-line and limbers being first called on.

Replacement of Casualties in Horses.

After a battery has come into action and the wagon teams and gun-limbers have been sent away, the only horses that would remain under fire would be those of the battery commander and of a trumpeter acting as orderly. In addition there would be under fire from time to time the wagon teams, during the exchange of wagons, and the horses of orderlies coming and going. We may therefore expect comparatively slight losses in the position itself among the horses, whilst the batteries remain in action. On the other hand the losses would be heavy in the position where the gun-limbers and wagon teams of the first-line are placed.² (*Sic*) It is advisable to tell off an officer or a senior N.-C officer to take charge from this point of view of the limbers, &c., in rear of the battery, as the échelon com-

¹ I presume the ammunition is packed in iron cages, holding three or four rounds, as in the German carriages.—*E.A.L.*

² This is not very clear as presumably the limbers and teams would be more or less under cover.—*E.A.L.*

mander has quite enough to do in arranging for the supply and replacement of ammunition.

The horses of officers and Nos. 1 can be replaced by the horses of trumpeters, coverers, and in horse batteries, the horses of spare gunners. The most important thing is the replacement of the draught horses. For this purpose, in the first instance, the spare draught horses will be used, and then the horses of the first-line wagons by reducing the teams to four horses. The teams of the second-line wagons must, if necessary, be reduced to two horses to complete the teams in front, and lastly, all the horses, if necessary, must be taken out of the empty wagons. It should be taken as a general rule to keep the gun teams up to *six* horses and the wagon teams up to four horses, using for this purpose the riding horses if necessary. As regards horse batteries, care must be taken to equalise the available horses among the detachments of all the guns. If, when a horse battery limbers up, there are more detachment horses than men, the spare horses must be at once put into the wagons that are short of horses. On the other hand, if there are more men than horses, men must be mounted on the limbers.

The harness and saddlery of killed and disabled horses should be removed and as far as possible placed on the wagons, preference being given to harness. The forage is also removed from these horses. Replacement of casualties in horses should be constantly practised in all its details.

The instructor can employ for this purpose, previously prepared tickets as described for the "*personnel*."

Casualties in Matériel.

It will rarely happen with *matériel* of the present day that guns will be totally disabled by fire.

Breech-blocks will require to be replaced, gun wheels exchanged, &c. The detachments should be practised in removing dismounted guns and broken gun carriages by means of the limbers, but it is doubtful whether the exact drill for each number, in cases of this sort, laid down in the drill-book, will always be suitable.

Replacement of Casualties among Commanders.

Casualties to brigade-division and battery commanders, and the consequent transmission of command to the next senior should be frequently practised, and at the most critical moments, as not only do the officers who succeed to the command, get most useful practice, but opportunity is given to the officers who have fallen out as disabled to observe at their leisure the working of their commands, and to pick out the weak points in their military training.

Preparations for Advance or Retreat.

The brigade-division commander, who is watching the tactical course of the action, will know in good time whether the movement will be to the front or rear, and takes his measures accordingly. The chief point for battery commanders to pay attention to in changes of position is the avoidance of all unsteadiness and confusion. As soon as the movement is decided on, the limbers and wagon teams are called up to the guns by orderlies sent by battery commanders, who say whether the movement will be an advance or retirement. The wagon teams are at once hooked-in, and the officers and Nos. 1 mount. The N.-C.O. in charge of the limbers and wagon teams reports to the battery commander that all is ready, and the latter orders "cease firing" and limbers up.

Before limbering up, the gun detachments are made up to five men per gun if possible.

Change of Position.

Changes of position for short distances are opposed to the principles of artillery

tactics. Changes of position should, as a rule, be made by roads, in columns. Only exceptionally and over very favourable ground can the batteries move in line, and to make use of a network of paths and tracks is only permissible when these can be easily and thoroughly reconnoitred beforehand. As a matter of fact, the reconnaissance of a considerable expanse of ground, as regards its practability for artillery, is a much longer and more difficult business than is generally believed. The line of advance, if necessary, must be marked out.

Wagon echelons follow always in sub-division or section columns by the roads.

Route March Exercises.

These should, if possible, be combined with field movements, and be carried out by brigade-divisions. Great attention must be paid to preserving an even pace throughout.

Loss of distance must never be made up by single teams, but by batteries, the leading sub-division being halted if necessary, and the whole closing up at an increased pace.

Training of Orderlies and Scouts.

Very great stress is laid on the importance of thoroughly training orderlies and scouts, and a scheme of instruction laid down. The training, it is recommended, should be carried out by one officer, specially detailed.

The system is the same as that described in the paper on "Ground Scouts and Combat Patrols," which appeared in the December number of the "Proceedings."

To be continued.

19

PRÉCIS
AND
TRANSLATION.

REVUE D'ARTILLERIE.

OFFENSIVE AND DEFENSIVE ARMS AT THE
BATTLE OF THE YALU.

BY

M. P. MERVEILLEUX DU VIGNAUX.

TRANSLATED BY

F. E. B. L.

M. DU VIGNAUX does not attempt to tell again the story of the battle, but avails himself of the more exact knowledge now procurable to derive some definite conclusions from its technical details. The Yalu battle, says he, is but an imperfect image of what would take place, say in the Mediterranean, in case of an engagement between two European fleets manned by well trained crews and furnished with up to date material.

The weight of a Chinese broadside was 6 times that of a Japanese, but that did not suffice to give the Petchili fleet any real superiority. The state of its material, the absence of quick-firing guns, and the want of training in the crews, placed the Chinese in a position of marked inferiority. We cannot therefore hope to deduce from the various phases of this engagement any conclusions of absolute finality for the conduct of modern warfare.

But some useful instruction may be obtained by the close study of certain episodes, and by submitting them to a sort of technical enquiry as to how far training and moral force may be considered negligible quantities in the estimation of the particular facts disclosed.

This enquiry will therefore be limited to an examination of weapons and armour without opening up the complex question of naval tactics.

1°—HULLS OF SHIPS. Machinery suffered little, but top hamper, such as military masts, was completely swept away. Men were wounded as much by splinters of the hull and superstructure as by those of shells.

All superstructures increase the number of splinters and the size of the target, and cause many shells to burst which would otherwise pass harmlessly overhead. They should therefore be reduced to a minimum compatible with the proper behaviour of the ship at sea.

There were numerous fires in the cabins and in the coal bunkers. Wood and paint should therefore be as scarce as possible. The Japanese officers have come to the conclusion that all bedding must be carried below the armoured deck when

a ship is cleared for action, for which purpose special bunkers should be supplied. The existing means on board ship for suppressing a fire seem inadequate. Finally, the relative values of certain materials of construction have been determined with some precision. Plates and structures of soft metal were not split or smashed, but twisted and put out of shape; so that they were susceptible of rapid repair either on board ship or in the arsenals.

The Japanese in particular made note of this when they had to repair the "Matsushima" which was fresh from the hands of its French constructors (*Forges et Chantiers de la Méditerranée*). This coast-guard vessel had suffered terribly, and the quality of the chief material of construction was much appreciated. In other ships, built with harder metal which had been split or broken, some repairs were extremely difficult.

2°—PROTECTION. Armour doubtless played an important part. It stopped the projectiles of quick-firing ordnance, whereas all unarmoured parts were hacked to pieces, as might have been expected. But armour of moderate thickness all over a ship's side would certainly have done more service than a thick belt. All the more so in future when the use of melinite shells may have to be reckoned with. Few shells strike the water line, the mean point of impact being much higher. Practical armour piercing is also much inferior to theoretical, mainly because the trajectory of a shell is rarely, if ever, normal to the surface struck.

On the other hand armour is not sufficient to command success, for in this respect the Japanese were much less protected than the Chinese. It seems certain that as mere dead weight, an increased artillery would be preferable to an increase of armour.

The hypothesis of a ship with a riddled hull continuing the fight, because its machinery, turrets and armoured bridge are intact, is illusory. Such a ship floats, it is true, but may be considered disabled and will be obliged to withdraw from the fight.

The armoured bridge does not always afford complete invulnerability. A Chinese ship had a portion of her bridge carried away by a 32 cm (12"-6) shell. A few minutes later she foundered and went down by the stern.

It would appear that the Chinese would have lost fewer ships had they paid more attention to water-tight compartments. None of the ships were armed with nickel-steel or Harveyized plates. The coal bunkers gave good protection. In one ship they are said to have stopped a shell of large calibre.

3°—RAM. Its effect was nil. Several attempts were made, but none quite succeeded. We must not conclude from this that the ram is useless. For it may well serve to annihilate a ship already disabled by artillery and torpedoes, or on the other hand a ship with its artillery silenced may as a final effort attempt to ram a better armed vessel which steers badly.

4°—SPEED. This element exercised a predominant influence. Admiral Ito, thanks to his superior speed, was able to fight the Chinese at the ranges which suited him best and to take the offensive. He shewed that a swift well armed cruiser can accept battle with a big battle ship. However, continuous evolutions at high speed necessitate an enormous consumption of coal.

5°—AUXILIARY CRUISERS. One of these, the "Saikio," an armed merchant ship, was surrounded and her rudder was disabled. She was in great danger, and part of the Japanese fleet had to go to her assistance. Such ships, having no protection, should not attempt to come to close quarters, but should be provided with powerful artillery so as to assume the offensive at a long range, and high speed to maintain it.

It was clearly seen at the Yalu how a slow ship could encumber the movements of a squadron.

6°—RIFLE FIRE. Effect nil. Mitrailleuses were useful at times, but rifles which employ many men were useless in comparison with mitrailleuses at all ranges.

7°—TORPEDOES. Locomotive torpedoes played but a small part in this engagement. In view of the ravages made in the batteries by artillery fire the presence of torpedoes in their tubes constituted an ever present and real danger.

The Japanese left their torpedoes in bunks. Several Chinese ships threw them into the sea to get rid of them.

Submarine tubes are not liable to this drawback, and would appear to be the only suitable method for discharging torpedoes from battle ships. The Chinese tried to torpedo several Japanese ships, notably the group of small ships which they surrounded. But, although the distance was only 80 metres, none of the torpedoes reached their mark. These attempts, made first with a torpedo boat, then with a cruiser, imply gross inexperience. The distance was really too small for torpedoes projected at an angle of depression, for one of them passed under the "Akagi." This constitutes an argument in favour of torpedo tubes being only slightly depressed and as near as possible to the water line. It is generally believed, and probably with truth, that if the Japanese had had any torpedo boats they would have inflicted still heavier losses on their opponents than actually occurred. And, notwithstanding its injuries, their fleet might not have been obliged to leave the field of battle at nightfall had they had any torpedo catchers to oppose to those of the Chinese.

8°—ARTILLERY. This arm exercised a predominant influence throughout. It was in fact gun fire which subdued the Chinese fleet. The highest calibre in the Chinese fleet was 30·5 cm (12") Krupp; in the Japanese the 32 cm (12"·6) Canet with a length of 40 calibres, one shell from which, as stated above, gutted an armoured bridge and sank the ship. On the other hand some 30·5 cm shells disabled the barbette tower of the "Matsushima" when the 32 cm guns had fired but 4 rounds. One of the former shells burst in the central battery of the same ship causing a conflagration and killing or disabling 80 men.

It is evident that the 30·5 cm and 32 cm guns had a considerable excess of power as against the plates of medium thickness to which they were opposed, and that heavy shells with high velocity crash through all they meet and have an annihilating effect.

It was proved however that simplicity in the working of such guns was of the first importance. The loading of the heaviest guns is bound to be a slow job. The hydraulic gear acted very well at first, but in some cases, after the firing of 3 or 4 rounds, bursting shells broke the hydraulic tubes and disabled the hoists and the laying gear. There should have been means of working the guns by hand. Electricity would be equally liable to injury from shell fire, but would admit of simpler arrangements. The advocates of electricity have always pointed out the danger of frost in connection with hydraulic gear.

One of the official reports on this subject during the war says: "Hydraulic gear was a source of much anxiety in frosty weather, in that stoves had to be constantly kept alight in the region of the turret and the working gear. It is believed that electric motors or even hand gear would have been preferable."

The 30·5 cm guns of the Chinese ships were in pairs, and generally one was loaded with a common shell, the other with a chilled or steel shell.

The simultaneous firing of the 2 guns, for which there was of course no good reason, was sufficient to cause some damage to the ship itself, so great was the shock to the hull.

10°—QUICK-FIRING GUNS. As regards this class of armament the Japanese had an incontestable superiority. The Chinese had still Krupp guns with wedge

breech-pieces, the manipulation of which is too slow. It must be added that the shooting on both sides from the guns of medium calibre was very wanting in accuracy, and the expenditure of ammunition was considerable.

When the three Japanese ships had been separated from the rest of the squadron the Chinese held them under their fire and should have been able to overwhelm them. The Japanese however escaped owing to the courage and manœuvring skill of their men.

It has been ascertained that several of the steel armour-piercing shells of the Japanese 12^{cm} (4.72") guns did not penetrate very deeply into the Chinese armour. At the ranges at which the battle was fought these guns had a relatively low remaining velocity, and it is believed that the English guns which the Japanese had did not possess sufficient muzzle velocity. It was scarcely 700 m.s. (2296 f.s.). The effect would have been much greater with about 800 m.s. (2625 f.s.). In addition to the increased *vis viva*, a flatter trajectory is obtained with a very high muzzle velocity, so much so that we may almost hope to lay guns point blank at the ordinary battle range of about 2000 yards. Otherwise the 12^{cm} showed itself to be an excellent calibre, easy to work and every way suitable for a cruiser.

11°—DISPOSITION OF THE GUNS. The drawbacks of an armour-plated central battery were made apparent when one shell disabled 80 men of the "Matsushima." To meet this every gun should have its own armoured emplacement, and this more especially in the case of heavy guns, which should never be mounted in pairs, whatever advantages that method may afford in the reduction of weight.

The smallest accident to the lifts or laying gear of a double gunned turret at once disables from one half to two thirds of a ship's offensive power.

This has often been stated. It has now been proved. At the very commencement of the action the twin 30^{cm} (12") guns of a Chinese barbette ship were disabled by a small shell, of which some fragments struck the hydraulic apparatus.

In the same way a single big gun, as on board the "Matsushima," is insufficient. It is better to have two of rather smaller calibre.

It would appear that existing barbette turrets do not protect sufficiently the men or machinery of the gun from the fire of small guns, a single shell from which may disable the barbette gun. Before however pronouncing irrevocably in favour of closed turrets we must remember their disadvantages: their weight, and their forming with the gun and its platform one single structure. What in fact would be the result of a shell not piercing a turret, but shaking the whole structure?

In any case guns must not be too close to one another, and all guns must have as wide a field of fire as possible to meet the varying circumstances of an engagement between two squadrons constantly performing rapid evolutions.

Broadside fire is henceforward useless, likewise electric firing from a distance. We may remark here that during the engagement all the channels for the electric connections of the firing gear of the quick-firing guns were damaged by the discharge of the big guns.

12°—EFFECTS OF PROJECTILES. There is no record of the penetration of thick armour by any steel shell. The Chinese chiefly fired common shell from their 30.5^{cm} guns. Of course a steel armour-piercing shell is comparatively useless against a cruiser. Neither of the fleets possessed any double shells, or any shells with high explosives. The effect of these may be guessed by the performance of the common shells.

13°—SUPPLY OF AMMUNITION. The Japanese big guns fired but few rounds; only 12 shells from the three 32^{cm} guns of the three coast-guard ships, a mean of only 4 rounds each.

On the other hand the quick-firing guns disposed of a large quantity of ammu-

munition. They report 200 rounds for a single 12 cm gun. At a given moment on board the "Matsushima" one hundred rounds were fired from 11 quick-firers in little more than a minute. It is said that one of the reasons why the Japanese withdrew their fleet at nightfall was the exhaustion of their supply of quick-firing ammunition.

On the Chinese side the eight 30.5 cm guns fired 197 rounds, say 24 to 25 each. Those of 15 cm (6") 268 rounds, or 67 each. But these were not quick-firers. The Chinese began first with common shell, and when no more of them were to be had they continued their fire with steel shell. The latter, as already stated, were found to be less efficient than the former. There was, especially in the Chinese fleet, a reckless squandering of ammunition, so it would be unwise to deduce any scheme of supply from their operations. But, as regards quick-firers, it would appear that 200 rounds per gun may be considered an adequate, but not excessive supply.

14°—FIGHTING RANGE. The Chinese opened fire at 4000 metres (some say 5000). The Japanese reserved theirs till they were 3000 to 3500 metres from the enemy.

At 2000 metres the cannonade became very lively. The Japanese, who constantly manœuvred at high speed, maintained a distance from the enemy, according to some accounts, of from 900 to 1400 metres. From this to 2000 metres may be considered the mean fighting range. If that be admitted, the advantage of high velocity and trajectory so flat as to admit of point blank firing at 2000 metres is apparent. The distances constantly vary, and it would be a very great advantage to be relieved from the necessity of continually altering the tangent scale.

The evolutions occasionally brought the 2 fleets to within a hundred metres of one another. At such times rapid firing guns become a first necessity, and the degree of rapidity attainable in breech closing and firing is no longer a negligible quantity.

Some have foretold for armoured ships an engagement at short range, with low velocity guns and highly explosive shells. This would at least have the advantage of utilising guns of old design. But such tactics can find no place where there are rapid cruisers maintaining a position at ordinary artillery ranges with an armament of high velocity guns.

Moreover the fire of the aforesaid low velocity guns would be speedily subdued even at short ranges by that of quick-firers.

In conclusion then it would seem that the battle of the Yalu points to the necessity of high velocities both from tactical and ballistic points of view.

It would seem also, as already stated, that armour should give place to increased artillery of higher power and each gun with a wider zone of action.

Otherwise naval war will be only a bloody struggle, in which both fleets will retire shattered and disabled, unable to again take the sea, and without victory on either side.

As has been justly said: defensive arms retard defeat, offensive arms give victory.

PRÉCIS
AND
TRANSLATION

“REVUE MILITAIRE DE L'ÉTRANGER.”

FEBRUARY, 1895.

ARTILLERY OF LARGE CALIBRE WITH
FIELD ARMIES.

BY

LIEUT.-COLONEL J. H. G. BROWNE, LATE R.A.

IN a recent number of the R.A. “Proceedings,”¹ attention was called to the steps taken by Germany towards the formation of heavy batteries with sufficient mobility to be attached to armies of operation. The same idea is in vogue in other countries, and although in some cases the period of practical organization has not been reached, the question of principle has been everywhere decided. Without speaking of Switzerland, where heavy batteries have been in existence ever since 1883 under the name of “artillery of position,” we know that Austria and Russia, as well as Germany, actually possess artillery of large calibre, intended to march with field armies.

Austria in time of war would form groups of portable siege batteries intended, according to official indications, not only for siege-warfare, but also for *certain operations of field-warfare*.

The *personnel* of these batteries is to be furnished by the Garrison Artillery, and the horses by the transport department. It is believed that the Austrian-Hungarian Ministry has provided for the formation of five groups of portable siege batteries, comprising each one battery of four 12^c guns, and two batteries of four 12^c mortars.

Some years ago Russia organised regiments of field-mortars of 15^c, actually furnishing 20 batteries. More recently she has created three battalions of so-called siege-batteries, which are absolutely distinct from the battalions of Garrison Artillery. The official documents do not lay down the manner in which these batteries are intended to be employed, but it is probable that it will be connected with the question now before us.

The organization adopted by Germany is not known in its details, but it is in a

¹ Foot Artillery with horsed carriages in Germany.—April 1895.

very advanced condition. The credit demanded by the War Minister in 1892, in order to form 17 groups of teams of horses intended for foot artillery, has just been partly granted, and it seems certain that the *matériel* of these heavy horsed batteries will be principally composed of 15^c howitzers.

Without going further into organization properly so-called, we have said enough to show that artillery of large calibre has acquired a definite position in foreign armies. It is therefore absolutely necessary to consider the *rôle* which will probably be assigned to this kind of artillery, and the rules which will guide its employment under the various conditions of warfare. In default of official instructions dealing with the question, we can only follow attentively the military publications which have appeared abroad, in order to glean from them, if possible, some ideas which will throw light upon the new problem now presented.

If we examine the reasons which have eventually led the Germans to form heavy portable batteries attached to field troops, we shall find that the promoters of this transformation have drawn their strongest arguments from the probable character of the wars of the future in the particular theatre of operations, which is especially interesting to Germany. According to them, the German armies will act on the offensive, and will certainly have to encounter permanent works manned by armies strongly entrenched upon positions prepared in advance, and it will be absolutely necessary to provide them with an artillery sufficiently strong to obviate the risk of their being shattered upon these obstacles. According to General Speck and others, the heavy artillery, attached to armies of operation, is intended exclusively to act against permanent and temporary works of fortification.

General Speck, in particular, taking the supposition that four armies are operating upon the western frontier of the empire against fortified positions, would attach the heavy batteries to the two armies entrusted with the front attack, giving none to the two other armies intended to guard the flanks. This amounts to saying that this heavy artillery would not be attached to armies of manœuvre.

Now that the desired object has been attained, and that the organization demanded by the reformers is an accomplished fact, so much so that foot artillery with horsed carriages—the fourth arm as it may be called—has actually taken part in combined manœuvres with field troops, the military writers, who treat of this question, seem to have modified and enlarged their ideas. They are enquiring whether this kind of artillery—created with a view to a particular case—ought to be restricted to the special *rôle* which was originally assigned to it, or whether it ought not in future to be looked upon as a necessary element in armies, independently of any peculiarities which may be prevented by the theatre of operations.

The advantages claimed to be derived from the employment of this new arm are :—

1st. A *moral advantage*, because their addition to armies of manœuvre would act as a new affirmation of the *spirit of the offensive and of the will to conquer*, at a time when the power of fire-arms furnishes arguments in favour of the defensive, and induces many people to exaggerate the difficulties of the offensive.

2nd. Considerable material advantages in the battle itself, because this heavy artillery will be a powerful and hitherto unknown means of deciding the contest more rapidly than heretofore.

The following words occur in an article recently published in the *Militär Wochenblatt*, “When the battle is sufficiently advanced to enable the forces in presence of one another to be estimated, then the moment has arrived to bring the heavy batteries into play, with a firm resolve to decide the issue. Thanks to the enormous effects of their projectiles, they will produce, both morally and physically, an effect which it would be impossible to obtain by other means. The fact, that the effect produced by pieces of large calibre is incomparably greater than that produced by

pieces of small calibre, then shows its full significance and largely compensates for the restrictions placed upon their use by the smaller supply of ammunition."

"This superiority shows itself in isolated effect, because the penetrative and the explosive force of the projectile are both greater in the case of heavy calibres, and it also shows itself in cumulative effect, because in the same space of time a greater weight of metal can be projected upon the target, which amounts to saying that the same effect can be produced in less time."

"This concentration of useful effect, this accumulation of destructive effects, gives to this attack the terrifying character of a whirlwind let loose by the elements, and adds to a condition of absolute depression the moral effect which is produced by the efficaciousness of fire. The effect of surprise is added to this moral depression, without counting the fact that the enemy has little time to adopt new dispositions in the face of the danger which threatens him. This last advantage is a very important one, the value of which will be especially felt in the battles of large masses, when the influence of space will be felt to a greater extent."

Thus the opinion now expressed in the German military press is that the heavy *artillerie d'armée* can and ought to be used in field warfare and that it should take an active part in battle.

In itself there is nothing unreasonable in this idea. In fact it may logically be deduced from the generally admitted principle that it is the duty of the commander-in-chief to concentrate all the available forces of the army upon the battlefield, which is the highest object of war and the issue of which decides the fate of the country. The difficulties begin, and the objections have more force, when we come to the conditions of practical realization. In fact we find ourselves face to face with a problem which cannot have a perfectly satisfactory solution, because on the one hand it is laid down unanimously that the introduction of heavy artillery into field armies must not make them lose their facility for manœuvre; whilst, on the other hand, the reasons which have led to the introduction of this artillery are almost entirely based upon their power, which entails increased weight. It is necessary therefore, in order to arrive at a suitable organization, to accept a compromise, and it is here that the solutions adopted in different countries differ among themselves. For example Russia has kept to the 15^c calibre, but has sacrificed the power of the piece of its other characteristics, so as to make it, as far as mobility is concerned, a true field-gun. On the other hand in Germany the military writers who have treated of this question, recommend that the present *matériel* should be maintained, lightened only by a suitable reduction in the quantity of ammunition carried. In fact they consider that the heavy artillery should only be employed upon points and under circumstances where *it alone* can produce decisive results.

"The object of the heavy batteries," says the author of the article quoted above, "is to shake the enemy's infantry upon the point where the commander-in-chief has decided to break through. If more than this is required of them they will fail. The talent consists in keeping the right limit."

According to German ideas it is absolutely necessary that the *artillerie d'armée* should not be engaged in the artillery combat, in order to preserve the power of producing at the proper time new effects in a startling manner.

It is evident that by limiting the task of the heavy artillery to preparing the breach, the necessary time will be gained to enable it to be brought into line, when required, without checking the movements of the other arms, and also that the equipment can be very much lightened, because a comparatively small supply of ammunition will be sufficient. It may be remarked—and it is a coincidence of some importance with regard to the rules for the employment of this arm—that the Russian opinions on the employment of the 15^c mortar evidently agree with those which have just been expressed. At a conference recently held at Moscow it was

held that mortars ought not to be brought into line during the artillery combat, but that they should remain with the general infantry reserve until they are required to prepare the way for the attack.

It would be quite premature to draw any absolute conclusions from the preceding remarks. Our object has simply been to show that in foreign countries much attention is being paid to questions relating to the employment of the heavy artillery, which is now practically organised in most of the armies of Europe.

The ideas put forward points to the employment of this artillery in field warfare, and assign to it a well defined *rôle* upon the field of battle, namely to prepare the breach at the point selected by the commander-in-chief.

Both in Russia and in Germany the principle is admitted that artillery of large calibre should be reserved for this purpose. If we wish to summarize the present ideas, it may be said that what is recommended is the creation of an ideal artillery reserve, sufficiently light not to interfere with the manœuvring power necessary for field armies, but at the same time powerful enough to provide the commander-in-chief with a certain means of forcing on the decision of the combat by producing effects hitherto unknown both in a material and a moral point of view.

PRÉCIS
AND
TRANSLATION.

"RUSSIAN ARTILLERY JOURNAL."

No. 4, April 1894.

THE RESISTANCE OF THE AIR AT HIGH
VELOCITIES.

BY

CAPTAIN ZABÚDSKÍ, RUSSIAN ARTILLERY.

TRANSLATED BY

MAJOR G. T. KELAART, R.A.

FROM the experiments with elongated projectiles carried out by himself, Bashforth and Krupp, General Mayevskí concluded that the air resistance, for velocities less than 240 metres per second and greater than 419 metres per second, is proportional to the square of the velocities; but near the velocity of sound, 340 metres per second, it increases according to a higher power than the second.

In 1884, Colonel Hojel of the Dutch Artillery concluded, from experiments in Holland and at Krupp's works, that for velocities exceeding 500 metres per second the resistance increases according to a lower power than the square; from his determination the power was equal to 1.91 between 500 and 700 metres per second.

In 1890 Krupp issued tables, giving resistances for velocities up to 700 metres per second, found from experiments with guns of various calibres; the velocities being determined at two points of the trajectory.

From these tables it appears that for velocities above 550 metres per second the resistances increases according to a lower power of the velocity than the square: from 550 metres per second to 800 metres per second the power is 1.70, from 800 metres per second to 1000 metres per second it is 1.55.

From Krupp's experiments, published in 1881, General Mayevskí deduced the resistances inserted in his memoir—"The solution of problems of direct and curved fire," 1882.

These tables gave the resistances for velocities up to 700 metres per second, and the 1890 tables continued them.

Making use of these tables, I have deduced expressions for resistances at velocities up to 1000 metres per second. Connecting them with the 1882 formulæ

of General Mayevskí, we obtain, with the metre and kilogramme as units :—

From $v=1000$ m/s to $v=800$ m/s, resistance $\rho = 0.7130 \pi R^2 \frac{\pi}{\pi_0} v^{1.55}$				
800	„	550	„	$\rho = 0.2616 \pi R^2 \frac{\pi}{\pi_0} v^{1.70}$
550	„	419	„	$\rho = 0.0394 \pi R^2 \frac{\pi}{\pi_0} v^2$
419	„	375	„	$\rho = 0.04940 \pi R^2 \frac{\pi}{\pi_0} v^3$
375	„	295	„	$\rho = 0.09670 \pi R^2 \frac{\pi}{\pi_0} v^5$
295	„	240	„	$\rho = 0.04583 \pi R^2 \frac{\pi}{\pi_0} v^3$
240	downwards	„	„	$\rho = 0.0140 \pi R^2 \frac{\pi}{\pi_0} v^2$

where R is the radius of the cylindrical portion of projectile in metres,

π = the density of the air during experiment,

$\pi_0 = 1.206$ kilogrammes per cubic metre.

From the above formulæ it is seen that with low velocities, the resistances are proportional to the square of the velocities; with velocities near to that of sound they increase according to a higher power; and with velocities above 550 metres per second, the increase is according to a lower power than the square.

If we regard the air as consisting of particles colliding with one another and possessing velocities various according to their magnitude and direction, then on the basis of the mechanical theory of gases the mean velocity of the progressive motion of the particles at a temperature of melting ice is equal to 485 metres per second and at $15^\circ C.$ about 500 metres per second.

Thus the law of the increase of the resistance of air changes at the velocities which are connected with certain properties of the air, *i.e.* at the velocity of sound and at the mean velocity of the air molecules.

2. Proposing in an edition of Internal Ballistics (which I have undertaken) to print detailed tables for the solution of problems of fire for velocities up to 1100 metres per second, calculated from the above formulæ, I shall in this note attach an abbreviated table of the values of the functions

$$D(u), A(u), I(u), T(u), B(u) \text{ and } M(u)$$

corresponding to the values u from 600 metres per second to 1000 metres per second.

In calculating the values of these functions the air resistances is expressed by the formula

$$\rho = 0.5091 \pi R^2 \frac{\pi}{\pi_0} v^{1.6};$$

the resistances determined by this formula (for velocities between 600 and 1000 metres per second) being nearly those of Krupp's 1890 tables.

This table, together with the ballistic tables of Lieut.-Colonel Langensheld, can be employed in the solution of problems of direct fire for velocities up to 1000 metres per second, but the signs of the functions must be paid attention to.

For values of u near to 700 m/s the functions, with the exception of $I(u)$, pass through zero; the functions $D(u)$, $A(u)$ and $M(u)$ change sign and become negative; the function $B(u)$ has a double root, as it preserves its positive sign on passing through zero.

The values of u where the functions pass through zero are shown in the note to the attached table.

3. We shall now apply this table and the tables of Lieut.-Colonel Langensheld to the solution of two problems.

Example I.—At the chief artillery polygon when firing on 29th February, 1894, from the 6-inch Q.F. gun of Canet, 50 calibres in length, with $27\frac{1}{2}$ lbs. of Oxtensk smokeless powder, velocities were measured at two points of the trajectory. The distances from the muzzle were

$$\begin{aligned} x_1 &= 89\cdot6 \text{ metres, mean velocity } v_1 = 785\cdot9 \text{ m/s (2579 feet per second),} \\ x_2 &= 509\cdot9 \text{ ,, ,, ,, } v_2 = 745\cdot2 \text{ m/s (2445 feet per second).} \end{aligned}$$

We require to determine λ in the formula¹

$$C = \frac{P}{(2R)^2} \cdot \frac{\pi_0}{\pi} \cdot \frac{1}{\lambda} \cdot \frac{1}{1000}.$$

The weight of projectile $P = 43$ kg. (105 lbs. Russian)
 ,, calibre ,, $2R = 0\cdot1524$ metres (6 inches).

The firing was carried out at a temperature of $7\frac{1}{2}^\circ C$. and barometric pressure $757\cdot4$ mm; from this and the table, inserted in Appendix I. to my "Exterior Ballistics," we shall find

$$\frac{\pi}{\pi_0} = 1\cdot099.$$

Denoting by C_1 the value of C for $\lambda = 1$, we shall obtain
 $\log C_1 = \cdot2265$.

In consequence of the small angle of projection, we can put $\alpha \cos \theta = 1$, also $\alpha = 1$ (Appendix I., "Exterior Ballistics," p. 19) so that

$$\frac{x_2 - x_1}{\lambda C_1} = D(v_2) - D(v_1).$$

From the appended table we shall find

$$\begin{aligned} D(v_1) &= -430\cdot7 \\ D(v_2) &= -238\cdot2 \\ D(v_2) - D(v_1) &= -192\cdot7; \end{aligned}$$

from the expression

$$\lambda = \frac{x_2 - x_1}{C_1 [D(v_2) - D(v_1)]}$$

we shall obtain

$$\lambda = \cdot7723$$

The projectiles, intended for Canet's gun, have a greater length of the head (about $1\cdot75$ calibres) than those, for which were found the expressions for the air resistances, cited in No. I; the length of the heads of the latter were about $1\cdot30$ calibres (here $\lambda = 1$).

Example II.—To determine the tabular data for the projectile, fired from Canet's 6-inch gun at the range $X = 2000$ sajenes, we have

$$\begin{aligned} P &= 43\cdot0 \text{ kgs. (105 lbs. Russian)} \\ 2R &= 0\cdot1524 \text{ metres (6 inches)} \end{aligned}$$

$$\frac{\pi}{\pi_0} = 1$$

$$\lambda = \cdot7723$$

initial velocity $v = 792\cdot5$ m/s (2600 f/s).

From the formulæ of my "Exterior Ballistics" (Appendix I., p. 46) employing the attached small table and the tables of Lieut.-Colonel Langeldsheld, we can calculate the required data.

We have

$$\log C = \cdot3810$$

and from the formula

$$\sin 2 \phi_0 = \frac{gX}{v^2} \left\{ 1 + [9\cdot0728] \frac{v^2 X}{c} \right\}$$

¹ Zabúdszí. Exterior Ballistics. Part II., p. 10.

the magnitude of the angle of projection (necessary for finding from the table the value of α) will be found to be

$$\phi_0 = 4^\circ 27'.$$

$$\alpha = 1.0010,$$

From the table
and we calculate

$$U = \alpha v \cos \phi_0 = 790.9.$$

We obtain the value of u , corresponding to the point of fall, from the equation

$$D(u) = \frac{\alpha X}{C} + D(U)$$

$$= 1776 - 454$$

$$= 1322,$$

whence

$$u = 468.6 \text{ m/s.}$$

From the above cited table we shall find

$$A(U) = -26.04$$

$$I(U) = .04969$$

$$T(U) = - .612$$

$$B(U) = - .276$$

$$M(U) = - .00113$$

$$A(u) = 133.62$$

$$I(u) = .14715$$

$$T(u) = 2.322$$

$$B(u) = 3.9441$$

From the formulæ

$$\tan \phi = \frac{C\alpha}{2} \left\{ \frac{A(u) - A(U)}{D(u) - D(U)} - I(U) \right\}$$

$$\tan \phi_c = \frac{C\alpha}{2} \left\{ \frac{I(u) - A(u) - A(U)}{D(u) - D(U)} \right\}$$

$$v = \frac{u}{\alpha \cos \theta_c},$$

$$I = C \{ T(u) - T(U) \}$$

and

$$Z = K \frac{\pi_0}{\pi} V X \left\{ \frac{B(u) - B(U)}{D(u) - D(U)} - M(U) \right\}$$

we shall obtain

$$\phi = 2^\circ 45'$$

$$\theta_c = 3^\circ 57'$$

$$v_c = 469.2 \text{ m/s (1540 f/s)}$$

$$T = 7.05 \text{ secs.}$$

$$Z = 4.73 \text{ metres.}$$

In calculating the derivation Z , the coefficient K is found from the formula

$$K = \frac{\mu \pi}{\gamma} \cdot \frac{x}{h} \cdot \frac{Cg}{1000}$$

where

$$\mu = .55$$

$$\frac{x}{h} = .32$$

$$\frac{\pi}{\gamma} = \tan 6^\circ,$$

since the angle of inclination of the rifling is 6° with Canet's 6-inch gun.

The coefficient K , entering in the formula for the derivation, ought to be determined on the basis of results of firing in calm weather. Ordinarily the coefficient K , when found from experiment, comes out larger (approximately $1\frac{1}{2}$ times) than when calculated by the above deduced formula.

BALLISTIC TABLES.*For solution of problems of direct fire for velocities above 600 m/s.*

u	$D(u)$	$A(u)$	$I(u)$	$T(u)$	$B(u)$	$M(u)$
m/s.	—	—	+	—	+	—
1000	1358 ₄₀	59,96 ₁₁₁	0,02711 ₈₀	1,629 ₄₁	1,947 ₉₇	0,00243 ₄
990	1318 ₄₁	58,85 ₁₁₅	0,02791 ₈₂	1,588 ₄₁	1,850 ₉₆	0,00231 ₅
980	1277 ₄₁	57,70 ₁₂₀	0,02873 ₈₅	1,547 ₄₂	1,754 ₉₅	0,00234 ₄
970	1236 ₄₂	56,50 ₁₂₄	0,02958 ₈₇	1,505 ₄₃	1,659 ₉₄	0,00230 ₅
960	1194 ₄₁	55,26 ₁₂₈	0,03045 ₈₉	1,462 ₄₃	1,565 ₉₂	0,00225 ₄
950	1153 ₄₂	53,98 ₁₃₃	0,03134 ₉₂	1,419 ₄₄	1,473 ₉₁	0,00221 ₅
940	1111 ₄₂	52,65 ₁₃₇	0,03226 ₉₅	1,375 ₄₅	1,382 ₉₀	0,00216 ₅
930	1069 ₄₂	51,28 ₁₄₃	0,03321 ₉₇	1,330 ₄₆	1,292 ₈₈	0,00211 ₆
920	1027 ₄₃	49,85 ₁₄₈	0,03418 ₁₀₀	1,284 ₄₇	1,204 ₈₆	0,00205 ₅
910	984 ₄₃	48,37 ₁₅₃	0,03518 ₁₀₂	1,237 ₄₇	1,118 ₈₄	0,00200 ₆
900	941 ₄₃	46,84 ₁₅₉	0,03620 ₁₀₆	1,190 ₄₈	1,034 ₈₃	0,00194 ₆
890	898 ₄₃	45,25 ₁₆₄	0,03726 ₁₀₉	1,142 ₄₉	0,951 ₈₀	0,00188 ₇
880	855 ₄₄	43,61 ₁₇₀	0,03835 ₁₁₂	1,093 ₅₀	0,871 ₇₈	0,00181 ₆
870	811 ₄₄	41,91 ₁₇₆	0,03947 ₁₁₆	1,043 ₅₁	0,793 ₇₆	0,00175 ₇
860	767 ₄₄	40,15 ₁₈₃	0,04063 ₁₁₉	0,992 ₅₂	0,717 ₇₃	0,00168 ₇
850	723 ₄₅	38,32 ₁₉₀	0,04182 ₁₂₃	0,940 ₅₃	0,644 ₇₁	0,00161 ₇
840	678 ₄₅	36,42 ₁₉₆	0,04305 ₁₂₆	0,887 ₅₄	0,573 ₆₇	0,00154 ₈
830	633 ₄₅	34,46 ₂₀₄	0,04431 ₁₃₁	0,833 ₅₅	0,506 ₆₄	0,00146 ₈
820	588 ₄₆	32,42 ₂₁₂	0,04562 ₁₃₅	0,778 ₅₆	0,442 ₆₁	0,00138 ₈
810	542 ₄₆	30,30 ₂₁₉	0,04697 ₁₄₀	0,722 ₅₇	0,381 ₅₇	0,00130 ₈
800	496 ₄₆	28,11 ₂₂₇	0,04837 ₁₄₄	0,665 ₅₈	0,324 ₅₃	0,00121 ₉
790	450 ₄₇	25,84 ₂₃₅	0,04981 ₁₄₉	0,607 ₆₀	0,271 ₅₀	0,00112 ₁₀
780	403 ₄₇	23,49 ₂₄₅	0,05130 ₁₅₃	0,547 ₆₀	0,221 ₄₆	0,00102 ₁₀
770	356	21,04	0,05283	0,487	0,175	0,00092

BALLISTIC TABLES.—*Continued.*

u	$D(u)$	$A(u)$	$I(u)$	$T(u)$	$B(u)$	$M(u)$
m/s.	—	—	+	—	+	—
770	356 ⁴⁷	21,04 ²⁵⁴	0,05283 ¹⁵⁹	0,487 ⁶²	0,175 ⁴²	0,00092 ¹¹
760	309 ⁴⁸	18,50 ²⁶⁴	0,05442 ¹⁶⁵	0,425 ⁶³	0,133 ³⁶	0,00081 ¹¹
750	261 ⁴⁸	15,86 ²⁷⁴	0,05607 ¹⁷⁰	0,362 ⁶⁵	0,097 ³⁰	0,00070 ¹²
740	213 ⁴⁹	13,12 ²⁸⁴	0,05777 ¹⁷⁷	0,207 ⁶⁶	0,067 ²⁶	0,00058 ¹²
730	164 ⁴⁹	10,27 ²⁹⁶	0,05954 ¹⁸³	0,231 ⁶⁸	0,041 ²⁰	0,00046 ¹³
720	115 ⁴⁹	7,31 ³⁰⁸	0,06137 ¹⁸⁹	0,163 ⁶⁹	0,021 ¹³	0,00033 ¹³
710	66 ⁵⁰	4,23 ³²⁰	0,06326 ¹⁹⁷	0,094 ⁷⁰	0,008 ⁶	0,00020 ¹⁴
700	16 ^{+ 50}	1,03 ^{+ 332}	0,06523 ²⁰⁴	0,024 ^{+ 72}	0,002 ¹	0,00006 ^{+ 15}
690	34 ⁵¹	2,29 ³⁴⁶	0,06727 ²¹²	0,048 ⁷⁴	0,003 ⁹	0,00009 ¹⁶
680	85 ⁵¹	5,75 ³⁶⁰	0,06939 ²²¹	0,122 ⁷⁶	0,012 ¹⁷	0,00025 ¹⁷
670	136 ⁵¹	9,35 ³⁷⁶	0,07160 ²²⁹	0,198 ⁷⁸	0,029 ²⁶	0,00042 ¹⁷
660	187 ⁵²	13,11 ³⁹¹	0,07389 ²³⁸	0,276 ⁸⁰	0,055 ³⁶	0,00059 ¹⁸
650	239 ⁵³	17,02 ⁴⁰⁷	0,07627 ²⁴⁸	0,356 ⁸¹	0,091 ⁴⁶	0,00077 ²⁰
640	292 ⁵⁴	21,09 ⁴²⁴	0,07875 ²⁵⁸	0,437 ⁸³	0,137 ⁵⁷	0,00097 ²¹
630	346 ⁵³	25,33 ⁴⁴³	0,08133 ²⁶⁹	0,520 ⁸⁶	0,194 ⁶⁹	0,00118 ²²
620	399 ⁵⁴	29,76 ⁴⁶²	0,08402 ²⁸¹	0,606 ⁸⁸	0,263 ⁸¹	0,00140 ²³
610	453 ⁵⁴	34,38 ⁴⁸¹	0,08683 ²⁹³	0,694 ⁹⁰	0,344 ⁹⁶	0,00163 ²⁵
600	507	39,19	0,08976	0,784	0,440	0,00188

Note.— $D(u)=0$ for $u=696,8$ m/s.

$A(u)=0$ „ 696,8 „

$T(u)=0$ „ 696,7 „

$B(u)=0$ „ 696,2 „

$M(u)=0$ „ 696,2 „

PRÉCIS
AND
TRANSLATION.

“REVUE MILITAIRE DE L'ÉTRANGER.”

July, 1894.

FOOT ARTILLERY WITH HORSED-CARRIAGES
IN GERMANY.

PRÉCIS BY

LIEUT.-COLONEL J. H. G. BROWNE, LATE R.A.

For some time past the manœuvres of the German Foot Artillery have appeared to be directed into an entirely new channel. In 1892 they received a special extension, and the inference was drawn that the Head-quarter Staff at Berlin contemplated some important change, which would soon be made known.

This expectation proved correct. The object of these manœuvres was to prepare the way for the creation of batteries of foot artillery with horsed-carriages, and the organisation of these batteries, which are intended to introduce an entirely new element into the battles of the future, is now an accomplished fact.

As long ago as 1891, 88 heavy draught horses were purchased by the War-Minister for the purpose of drawing heavy guns at manœuvres. Since then a good deal has been written on the subject, and a pamphlet published in 1892 by General Wiebe, of the artillery, is of special interest. After insisting upon the increasing importance of foot artillery, especially for the attack of fortified positions, the general says:—“The best way to increase the number of cases in which foot artillery can be usefully employed, is to form moveable heavy batteries for the attack and defence of fortified positions. To make this possible, these batteries must be ready to follow the field-troops over any ground, so as to be able to come into line when and where they may be required. Now this result will certainly be attained if the foot artillery are given a light and portable *matériel*, as well as sufficient means of transport. Moreover, to enable this arm to realize the hopes which are founded upon it, it is necessary that it should be trained in peacetime for the different services which it may be called upon to perform in time of war. The heavy batteries of the foot artillery ought, therefore, to be thoroughly conversant with all the details of field service.” In conclusion General Wiebe demanded that a certain number of teams of horses should always be at the dis-

posal of the foot artillery to enable them to take part in the grand manœuvres in the same manner as the other troops.

Shortly after the publication of this pamphlet, the chancellor of the Empire presented his military budget to the Reichstag, in which he estimated for 17 groups of teams of horses intended for the exercises of foot artillery. This proposition was modified by the Reichstag, and the foot artillery at present has nominally at its disposal only 88 horses, which are attached to infantry battalions. It is probable, however, that the German Head-quarter Staff has taken some steps to procure the horses which have been refused by the Reichstag—at any rate the formation of groups of teams has only been deferred in all probability for a time. In fact the *matériel* intended for batteries of foot artillery with horsed-carriages is, if not actually constructed, at any rate settled in its principal details, and there is little doubt that the troops will henceforward be exercised in its use, so as not to be behindhand in the duties, which will devolve upon them in time of war.

The armament of these heavy batteries, which we will henceforth call *batteries d'armée*, in accordance with an expression much used in the military press, comprises at present three distinct pieces of ordnance, viz., the heavy, steel-barrelled gun of 12 centimetres (5·7 inches); the shell-gun of 15 centimetres (6 inches); and the steel-barrelled mortar of 21 centimetres (8·3 inches).

The heavy 12^c gun is of bronze with a central tube of nickel steel, which has been added to increase the resistance of the tube against the destructive effects of the *obus-torpille* bursting in the bore. It fires two kinds of projectiles, an *obus-torpille*, and a shrapnel, and is provided with double-action fuzes. It is mounted on a wheeled carriage with limber.

The shell-gun of 15^c which has lately replaced the 15^c mortar and the 15^c short gun in the armament of the foot artillery, is a new steel piece, firing a shell of about 40 lb. weight, with a slow burning double-action fuze.

The third piece of ordnance is the 21^c bronze mortar with steel tube, which throws a shell weighing 145 lbs. It is used with a percussion fuze and has a large bursting charge.

To organize batteries with these pieces, provision must be made for the transport of equipment, of wood for platforms, &c. For this purpose, the Germans have made use of old-pattern wagons, suitably adapted for the new service for which they are intended. They are light enough to be able to follow field-troops without much difficulty.

From the preceding details, the part which these heavy batteries are intended by the Germans to play on the field of battle, may be conjectured; and although no official document has been issued on the subject, a perusal of the military press will give us an approximate idea. It is evident that the Germans cherish the hope that curved fire will play an important part in the battles of the future, and if we examine more attentively the properties of the three pieces of ordnance which we have just described we shall see well enough what is the *rôle* reserved for each of them.

Of all the heavy mobilised batteries, those which are armed with the 15^c shell-gun will probably play the principal part. This piece, which is lighter than the others, seems intended by nature to support an attack. It can, at a pinch, be drawn by six heavy draught horses, at any rate over made roads and at a slow pace; and it has a powerful projectile which would do serious damage to field works. If, however, this gun is not powerful enough to destroy the defender's shelter-works and to shake his *moral*, recourse would be had to the 21^c mortar, which, however, being much less portable, could be only sparingly employed.

The use of the heavy 12^c gun is more difficult to lay down, as none of the German military writers seem to look upon its employment as permanent. It is a direct firing gun and will probably be employed on the defensive, when curved fire

will be of little use, on account of the moving character of the objects aimed at.

With regard to the employment of these heavy batteries, in the absence of official information we may refer to the *Jahrbücher*, published at the beginning of the year by Major-General Speck of the Bavarian army. According to him these batteries would not usually be attached to army corps, but would be kept under the orders of the Commander-in-Chief.

German field batteries already possess the means of searching out ground behind parapets, and recourse would be had to the heavy batteries only when the *obus-torpille* had failed.

Probably the whole of the German armies of operation would not require heavy batteries. General Speck estimates that the armies of the west would not require more than 64 batteries of this description, or 16 to each army corps. These would be divided into 12 regiments, 8 of which would be of shell-guns and 4 of mortars. The greater proportion of shell-guns to mortars is thus accounted for. "A line of defence, even when prepared in peace-time, would only have its points *d'appui* and intermediate works strongly fortified; the rest of the line would consist of ordinary field fortifications. It will, therefore, suffice to have in the armies intended for the attack of these lines a small number of mortars of heavy calibre and a larger proportion of 15^c shell-guns." It is worthy of remark that the general does not allude to the 12^c gun, which does not appear in the organisation, which he recommends. It seems a pity that he does not try to justify completely the demand for 16 batteries, which he wishes to be attached to each army corps of the first-line. In default of such justification it seems difficult to help thinking that the number is unnecessarily large. There would be 48 six-piece batteries of shell-guns, and 16 four-piece batteries of mortars, making a total of 288 shell-guns of 15^c, and of 64 mortars of 21^c. This seems too much for the attack of one or two forts, and it would be a triumph for the defenders to have obliged their enemy to deploy so great a force of heavy artillery.

The composition of these batteries is not laid down, but in all probability the shell-gun batteries would have six pieces, like field batteries. In order to carry 60 rounds for each piece, 12 ammunition wagons would be necessary. In addition, there would be one wagon for each gun to carry wood for platforms, one general-service wagon, one forge, and no doubt two carriages for baggage and provisions. Thus the whole battery will be composed as follows :

Guns.....	6
Ammunition wagons ..	12
Platform wagons	6
General-service wagon	1
Forge	1
Wagons for baggage and provisions.....	2
<hr/>	
Total.....	28

This estimate, however, may not be exact.

General Speck gives us to understand that two ammunition columns will be attached to each battery of shell-guns. The composition of these columns is not given, but they would probably consist of 20 ammunition wagons, carrying 30 rounds each. Each column will thus carry 600 rounds or 100 rounds per piece, and the battery will thus have altogether a supply of 260 rounds per piece.

The composition of the mortar batteries would probably be the same except that there would be only four pieces per battery, and that the weight of the projectile is such that each wagon could only carry 10 rounds. With its 12 ammunition wagons the battery would have with it 20 rounds per piece. Each mortar battery would have 3 ammunition columns attached to it. Supposing each of these

columns to consist of 20 carriages, there would be a total of 600 rounds or 150 rounds per piece in addition to the 20 rounds with the battery.

On the march the *batteries d'armée* would, as a rule, follow the columns and trains of the army corps, in connection with which they have been mobilized. According to General Speck, on a good road no slopes of less than 8 degrees would offer any inconvenience to the batteries of shell-guns, which would keep pace with the infantry. On bad roads, however, this pace could not be kept up. He makes no attempt to conceal the difficulties, which the heavy batteries would encounter as soon as they came near the enemy's position, when roads are blocked and movements become more and more difficult. In spite of this the heavy batteries would have to be pushed to the front by forced marches; and a careful reconnaissance of the roads would have to be made as their quality is a most important factor in the movements of the batteries. This reconnaissance must necessarily entail a loss of time, by which the defenders ought to know how to profit.

So long as the employment of the *artillerie d'armée* is not imminent, it may follow the army corps to which it is attached, in the same manner as all the heavy batteries follow the armies. As soon as the attack of a fortified position is contemplated, it will be decided, according to the nature of the enemy's works, which of the batteries must march with the columns of attack. If the works have only been constructed since the war began, the shell-guns should be sufficient, and should be placed at the tail of the fighting columns of troops. They should not be pushed further forward unless the distance to be traversed is short, and cover can be obtained from ground. If permanent works have to be attacked, mortars as well as shell-guns must be brought up,

Owing to the length of time which the *batteries d'armée* must necessarily take in coming to the front of the column, it is most important that the army corps should be able to march on several roads. Also, they move so slowly and offer so large a mark to the enemy's guns, that it is almost indispensable that they should be able to move into position under cover from ground. With this object in view, it will often be necessary to leave the main roads and take to bye-roads of uncertain character. A careful reconnaissance of these roads will be necessary to avoid delays. General Speck considers that a company of infantry must be attached to each *batterie d'armée* to clear away obstacles, prepare emplacements for the platforms, &c. It is evident that such operations can only be carried out under cover from the view and fire of the enemy, and therefore the infantry must previously be employed to drive back the enemy's advanced-posts. As this first phase of the struggle will probably take some time, and as the movements of the heavy batteries will be slow, it will probably be difficult to complete the operations in one day. It may therefore be expected that after the completion of these preliminary operations, the *artillerie d'armée* will not be able to open fire before the following morning at the earliest, and a delay will thus be caused in the operations of the assailants. This delay will be to the advantage of the defenders, who will gain time to bring up reinforcements, or to strengthen their field-works.

The position of the assailant will hardly be better when in front of temporary works. In this case also a careful reconnaissance will be necessary to avoid false movements of the columns of the *artillerie d'armée*. These heavy batteries lack the mobility of field guns. It is difficult for them to change position, consequently the ground must be carefully reconnoitred beforehand.

It must be remarked that batteries using curved fire can generally be placed in position more easily than those using direct fire, because it is not necessary that they should have a clear field in front of them. They may be placed behind obstacles which shut out the view, as it is sufficient that the result of the fire should be observed from a position near at hand and connected with the batteries by telephone, if necessary. This diminishes the length of the necessary reconnaissance; but fire

executed under such circumstances must evidently be slow and partake of the character of siege-firing, rather than that of field-firing.

From the preceding remarks, it is evident that it would be a great mistake for the defenders to abandon the ground in front of their works too soon. On the contrary they should hold on to it as long as possible and force the enemy to make a first deployment of the *artillerie d'armée*. If the defender's works are only of a temporary, instead of a permanent nature, the same series of obstacles will have to be confronted. Of course it will not be necessary to employ so great a number of heavy pieces, and shell-guns would probably be used in preference to mortars, but it would still be necessary to bring a considerable number of pieces of large calibre into action, in order to force the line.

Even when the assailants have succeeded in approaching within easy range of the works and have got a part, at any rate, of their heavy guns into position, the defenders need not abandon exterior action. Curved fire has little effect against objects in motion, such as infantry marching to the attack, and under favourable circumstances, the defenders might attempt to capture the batteries intended for this class of fire, which can change their aim but slowly, and which are consequently more exposed to sudden attack than the other.

General Speck does not attempt to ignore this danger, but recommends that in such cases recourse should be had to the neighbouring field batteries which, with their low trajectories are better suited for checking troops on the march. This, however, would require a good deal of vigour and decision, as these batteries would have to change their aim rapidly when already engaged in the combat.

It is evident from General Speck's essay, as well as from the previous essays of General Von Sauer and General Wiebe, which were noticed sometime ago in the "Proceedings," that the Germans are convinced that curved fire will render works of fortification of every kind untenable in a comparatively short time, and the creation of batteries of foot artillery with horsed-carriages is intended to provide for its use. Considered from the point of view of siege-warfare the new organization is perhaps a step in advance of the old, but in field-warfare we may believe that the employment of these heavy batteries will always be attended with difficulties on account of the weight of their *matériel*. In order to bring them into effective action, considerable efforts will be necessary and numerous precautions must be taken, which will often cause delays, from which the enemy will sometimes derive great advantage.

NOTES

FROM

CORRESPONDING MEMBERS.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below :—

Major-General Stubbs's "List of Officers of the Bengal Artillery," price 5s. 3d.

"Field Artillery Fire," by Captain W. L. White, R.A., price 1s. 2d.

"Notes of Lectures on Artillery in Coast Defence," by Major A. C. Hansard, R.A., price 1s. 2d.

"Ranging Note-Book," by Captain S. W. Lane, R.A., price 1s. 1d.

"Achievements of Field Artillery," by Major E. S. May, R.A., bound, price 2s. 6d.

"The Value of Mobility for Field Artillery," by Major E. S. May, R.A., paper covers, price 3d.

"The Young Officer's 'Don't,' or Hints to Youngsters on Joining," by an Officer R.A., price 7d.

The two Numbers of "Nature" containing Professor C. V. Boys's Lecture on "Photography of Flying Bullets," fully illustrated, price 8d.

Examination questions in (c), (d), and (e) set in the four examinations ending May 1893 :—

Captains (c) and (d) ... price 1s. 1d.

Lieutenants (c) (d) and (e) price 1s. 1d.

Tables of Four-Figure Logarithms, pocket edition, mounted on linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid down for inspection, price for pair (lead and wheel), 1d.

R.A.I. "DUNCAN" PRIZE ESSAY, 1895.

The Secretary has received essays bearing the following mottoes :—

"Pro aris et focis."

"Take him to develop, if you can,
And hew off the block, and get out the man."

"The delegation of command is a necessity."

THE R.A. Institution has recently obtained possession of the Peninsular medal with 13 clasps of Gunner Rollands, R.A. This medal will be placed in a case for exhibition in the Institution with an inscription showing that Rollands served from Roleia to Nive as a gunner without any absence from duty throughout the period.

THE following statistics have been communicated to the Committee, R.A.I., with a view to publication as of general regimental interest :—

	NUMBER DURING			
	1893	1894	INCREASE.	DECREASE.
Recruits	5645	5003	—	*642
From Desertion	298	284	—	14
Dead	331	357	26	—
Discharged	2006	1920	—	86
To Desertion	801	642	—	159
To Army Reserve	2241	2175	—	66
Courts Martial (Home only)	1032	809	—	223
Minor Punishments (Home only)	13092	11090	—	2002
Fines for Drunkenness (Home only) ...	684	641	—	43
Men in possession of Good Conduct				
Badges (Home only)	6715	6861	146	—

* The decrease in the number of recruits is due to our requirements having been less in 1894 : as an instance we may quote the fact that in September, 1893, recruiting for drivers was open only in Eastern District and Woolwich. On 2nd October, 1893, all artillery agencies were opened for drivers. On 25th November, 1893, all districts were opened for drivers. On 31st May, 1894, recruiting closed for drivers in all districts except artillery districts Newport and Woolwich.

THE

ROYAL ARTILLERY ANNUAL DINNER

WILL TAKE PLACE AT

QUARTER BEFORE EIGHT O'CLOCK,

On FRIDAY, 7th JUNE, 1895,

AT

THE HOTEL MÉTROPOLE

(Private Entrance in Whitehall Place),

HIS ROYAL HIGHNESS THE COLONEL OF THE REGIMENT
IN THE CHAIR.

Prices as follows :—

	£	s.	d.
Subscribers	0	16	0
Non-Subscribers	1	15	0

Dinner Tickets will not be supplied, but officers are requested to give their visiting cards at the entrance, on the evening of the dinner, to the official appointed to receive them.

It is particularly requested that officers intending to dine will furnish *early* intimation to the Honorary Secretary ; and, to avoid inconvenience, it is desirable that the same should be accompanied by *cheque*, for the amount of subscription to the dinner, *except from officers who bank with Messrs. Cox & Co.*, who are informed that the amount due from them for the dinner will be charged to their accounts.

Names of officers who notify their intention of being present at the dinner cannot be removed from the list after the 4th June, and officers who omit to notify before that date will be charged an extra sum of 5s.

Advertisements will duly appear in the *Morning Post*.

All communications to be addressed to

MAJOR F. G. STONE,

Hon. Secretary R.A. Dinner Club,

HORSE GUARDS,

WAR OFFICE, PALL MALL.

Should an officer wishing to dine have been unable to give notice before 4th June, he should inform the Secretary at the War Office direct, and not apply to the Hotel officials.

SHOEBURYNNESS.

As a great number of officers will be coming to Shoeburyness during the year, it may be of interest to those who are making their first visit to know what amusements they will be likely to find.

Cricket, of course, is of the best; an attempt will be made to keep the grass down on the golf links, which are much improved, though the rabbits are somewhat trying to the secretary's temper; there are six tennis and two stické courts, and very fair boating and sailing may be had.

Stické is much played by the courses, the only equipment required is a pair of tennis shoes and a light tennis racquet.

We enjoyed skating during the whole period of the frost on a private pond for which we are indebted to Lient.-Colonel Howard. There were several "at homes" on the ice, and the School of Gunnery Band gave an opportunity seldom available, of dancing to music on skates.

Football has been rather interfered with, but Shoebury has been very successful of late and can produce a good team. We have won the semi-final in Grays' Charity Cup, beating Barking, the holders, by 3 goals to two. We unfortunately had to scratch in the third round of the Army Cup, owing to the regulations, which debarred the "young officers" from playing, and also prevented No. 2 Company from being represented in the team. The constant changes taking place here rather handicap us in competing with infantry battalions.

In accordance with the new arrangement, several gentlemen cadets, awaiting commissions, have joined. They will swell the numbers in mess, and prove, let us hope, a great addition to all our games.

WOOLWICH.

THE ROYAL ARTILLERY DRAG HUNT POINT-TO-POINT RACES.

Committee: R. Stewart Savile, Esq. (M.F.H.), Colonel R. D. E. Lockhart, R.A., Lieut.-Colonel F. A. Yorke, R.A., Major H. V. Hunt, R.H.A., Major F. T. M. Beaver, R.A., Major L. E. Coker, R.A., and Captain C. D. King, R.A. Hon. Sec.: Major J. F. Manifold, R.A.

The R.A. Drag Hunt Point-to-Point Races came off on 19th March at Kemsing. Through the kindness of Sir Mark Collett, leave was given to ride over his land,

and the Hunt are greatly indebted to Mr. Ernest Cronk of Sevenoaks for the trouble he took in arranging for the line.

A special train from Bromley took down about 70 people and 23 horses, and arrived a little before 3 p.m. The first race was started soon after that hour, the other two at about half-an-hour's interval. The day was fine and the going excellent. The fences were certainly big, and the last one before finishing wanted doing. The course which was about three-and-a-quarter miles ran in the shape of an ellipse and was a thoroughly fair hunting one; fences could be taken anywhere and there were no traps. A good many of the people living in the neighbourhood attended, among them were Mr. Savile (M.F.H.) and Mrs. Savile, Hon. Ralph Nevill, and many members of the West Kent Hunt. Although there were several falls, there were no accidents and the day was pronounced a great success.

GARRISON CHALLENGE CUP. Presented by Major-General A. H. Williams, R.A. For bonâ-fide Maiden Hunters that have been regularly hunted with the R.A. Drag during the past season. Catch weights over 12 st. 7lbs., to be ridden by their owners:—

Capt. Heygate's MIDSHIPMAN.....	OWNER	1
Mr. England's CHOPETTE.....	OWNER	2
Capt. Birch's BEEFEATER.....	MR. G. GILLSON	0
Mr. Head's DAVID	OWNER	0
Mr. J. B. Aldridge's DUCHESS.....	OWNER	0
Mr. C. Prescott-Decie's MAVOURNEEN.....	OWNER	0
Mr. Butler's MOLLY.....	OWNER	0
Mr. Peel's DONOVAN.....	OWNER	0

HEAVY WEIGHT RACE. For horses the property of Members, and regularly hunted with the R.A. Drag. Catch weights over 14 st. :—

Mr. C. Prescott-Decie's SUNBEAM.....	OWNER	1
Mr. Gillson's PUFF.....	OWNER	2
Mr. H. L. Powell's EXETER.....	OWNER	0
Capt. Ferrar's RUFUS.....	OWNER	0
Mr. Staveley's BACCHUS.....	OWNER	0
Capt. Heygate's SHAMROCK.....	OWNER	0
Mr. Cowper-Smith's PARKER.....	OWNER	0

FARMERS' RACE. (Started with the Heavy Weight Race). For horses the bonâ-fide property of Farmers resident in the West Kent Country. Riders to be qualified to ride in the West Kent Hunt Point-to-Point Races. Catch weights over 12 st. 7 lbs.; owners riding allowed 7 lbs. :—

Mr. Warde's MR. SMART.....	MR. P. WILMOT	1
Mr. Wilmot's ARGUS.....	OWNER	0
Mr. Fishenden's LADY BLANCHE ..	MR. LASSETER	0
Mr. Cole's KENNY.....	OWNER	0

LIGHT WEIGHT RACE. For horses the property of Members, and regularly hunted with the R.A. Drag. Catch weights over 12 st. :—

Capt. Ferrar's SURPRISE.....	OWNER	1
Mr. Peel's GUY FAWKES.....	OWNER	2
Mr. Head's KITTY	OWNER	0
Mr. Ashmore's ROCK SPRING.....	OWNER	0
Mr. J. B. Aldridge's CANDY.....	OWNER	0
Major Cunliffe's COLUMBINE.....	CAPT. W. PAGET	0
Mr. Williams's ELEVATOR.....	OWNER	0

OBITUARY.

GENERAL R. F. COPLAND-CRAWFORD, Colonel-Commandant, who died at Harrow, on 5th March, 1895, was first commissioned as Second Lieutenant 19th May, 1828; became Lieutenant 12th May, 1829; Second Captain 1st April, 1841; Captain 1st April, 1846; Lieut.-Colonel 17th February, 1854; Brevet-Colonel 28th November, 1854; Major-General 31st August, 1865, Colonel-Commandant 13th September, 1871; Lieut.-General 31st January, 1872, and General 1st October, 1877. General Copland-Crawford was Commandant at Cape Town from 14th October, 1857, to 17th February, 1858. Since the 6th December, 1886, he was senior Colonel-Commandant of the regiment, and as such returned thanks at the Annual Regimental Dinner, in 1894 he was unable to attend the dinner owing to family bereavement.

By his death General Sir Collingwood Dickson, V.C., G.C.B., Master-Gunner of St. James's Park, becomes senior Colonel-Commandant.

LIEUT.-GENERAL H. P. GOODENOUGH (retired) died at Hyères, France, on 25th February, 1895. He joined the regiment as Second Lieutenant 13th December, 1836; became Lieutenant 13th August, 1839, Second Captain 9th November, 1846; Captain 15th August, 1852; Lieut.-Colonel 15th September, 1857; Brevet-Colonel 15th September, 1862; Major-General 9th November, 1868; and retired with hon. rank of Lieut.-General 1st May, 1880.

LIEUT.-GENERAL W. J. GRAY (retired) whose death occurred at Alverstoke on 3rd March, 1895, joined the Bengal Artillery as Second Lieutenant 8th December, 1843; became Lieutenant 22nd December, 1845; Captain 27th April, 1858; Brevet-Major 31st October 1867; Lieut.-Colonel 7th May, 1868; Brevet-Colonel 7th May, 1873; Major-General 31st December, 1878, and retired with hon. rank of Lieut.-General 7th June, 1882. General Gray served in the Sutlej campaign 1845-6, and was present at the battle of Aliwal (medal); in the Punjab campaign 1848-9, Passage of the Chenab, battles of Chillianwallah and Goojerat, where he served in one of those heavy batteries which "manœuvred with the celerity of light guns," and for his services in this campaign was favourably mentioned by Brigadier-General Tennant (medal with two clasps); he also served through the Indian Mutiny campaigns 1857-9, including the siege of Delhi where he commanded a party of 60 European Artillerymen for the assault of the breach of the Cashmere bastion (medal and clasp).

From 1873 he held various Royal Artillery commands in India until promoted Major-General in December, 1878.

MAJOR-GENERAL H. HEYMAN (retired) who died in London on 24th February, 1895, joined the regiment as Second Lieutenant 18th June, 1845; became Lieutenant 1st April, 1846; Second Captain 29th November, 1853; Captain 23rd February, 1856; Brevet-Major 4th March, 1866; Lieut.-Colonel 29th February, 1868; Brevet-Colonel 1st March, 1873; retired with the hon. rank of Major-General 1st October, 1881, and commuted retiring allowance 1st June, 1883. Major-General Heyman was Superintendent, Royal Carriage Department, from October, 1876, to 30th September, 1881.

MAJOR-GENERAL J. E. THRING (retired) died at Teddington on 11th March, 1895. He was commissioned as Second Lieutenant 19th December, 1844; became Lieutenant 1st April, 1846; Second Captain 19th May, 1853; Captain 23rd February, 1856; Brevet-Major 30th July, 1858; Lieut.-Colonel 6th July,

1867; Colonel 6th July, 1872, and retired on full-pay with the hon. rank of Major-General 30th May, 1877. Major-General Thring served during the Crimean campaign, and was present at the siege and fall of Sebastopol (medal with clasp and Turkish medal). Indian Mutiny 1857-8, actions of Secundra, Chanda, and Sultanpore, siege and capture of Lucknow, and relief of Azunghur (five times mentioned in despatches, Brevet of Major, medal with clasp).

COLONEL Æ. DE VIC. TUPPER (retired) whose death occurred at Guernsey 23rd February, 1895, was first commissioned as Second Lieutenant 23rd October, 1854; became Lieutenant 16th December, 1854; Second Captain 28th June, 1861; Captain 28th September, 1871; Major 5th July, 1872; Lieut.-Colonel 23rd April, 1881; Brevet-Colonel 23rd April, 1885; was placed on half-pay 23rd April, 1886, and retired 8th May, 1889. Colonel Tupper served during the Crimean campaign 1855, and was present at the siege and fall of Sebastopol (medal with clasp and Turkish medal).

LIEUT-COLONEL S. M. GRYLLS (retired) died at Woking on 14th March, 1895. He joined the regiment as Second Lieutenant 19th December, 1848; became Lieutenant 3rd November, 1849; Second Captain 13th August, 1855; Captain 20th June, 1862; Brevet-Major 6th June, 1856; was on temporary half-pay from 26th January to 1st July, 1861, retired on half-pay 22nd September, 1862, and commuted 3rd January, 1871. He was granted the hon. rank of Lieut.-Colonel 1st January, 1868. Lieut.-Colonel Grylls served during Crimean campaign 1854-55, including the affairs of Bulganac and McKenzie's Farm, the Battles of Alma, Balaklava and Inkerman, capture of Balaklava and siege of Sebastopol (medal and clasp). Indian Mutiny 1858-59, including the capture of Rampore Kussie, the passage of the Gogra, and minor affairs on the Nepaul frontier (medal).

LIEUTENANT H. B. CHATTERIS (retired) died at Brass, Niger Coast Protectorate, on 8th March, 1895. He was commissioned as Second Lieutenant on 15th February, 1889, and resigned 16th May, 1891.

LIEUTENANT E. ST. G. COBBOLD (retired) whose death occurred at Felixstowe, on 23rd February, 1895, joined the regiment as Lieutenant on 23rd December, 1857, and resigned on 19th July, 1864.

DIARY OF FIXTURES.

APRIL.

Day of the					
Mth	Wk.	Regimental.	Cricket, &c.		Private.
1	M	Senior class joins at Woolwich	...	...	...
2	T	...	...	...	...
3	W	R.A. Band Concert at 9 p.m.	...	...	...
4	Th	...	...	...	...
5	F	Long course leaves Woolwich	...	...	...
6	S	...	...	...	...
7	S	...	...	...	...
8	M	...	...	...	...
9	T	...	...	...	...
10	W	...	...	...	...
11	Th	...	...	...	...
12	F	Good Friday.	...	...	...
13	S	...	...	...	...
14	S	Easter Day.	...	...	...
15	M	Bank Holiday.	...	...	...
		Firemasters' class begins	...	...	...
16	T	...	...	...	...
17	W	...	R.A. Regimental Races at Aldershot	...	...
18	Th	...	...	...	'Ubique' Mark Lodge of Mark Master Masons meets at "Criterion."
19	F	...	...	...	...
20	S	...	...	...	...
21	S	...	...	...	...
22	M	...	...	...	...
23	T	...	...	...	...
24	W	...	R.A. v. R.E. Inter-regimental golf matches, at Sandwich.	...	...
25	Th	...	...	...	...
26	F	R.A. Band Concert in London	...	...	...
27	S	...	...	...	...
28	S	...	...	...	...
29	M	...	...	...	...
30	T	...	...	...	...

MAY.

1	W	1st Division (Siege) course at Lydd begins.	R.A. Woolwich v. R.N. College, at Woolwich.	...	...
2	Th	...	...	...	...
3	F	...	...	...	...
4	S	1st Division course begins at Portsmouth and Sandown. 1st Division R.H.A. (Aldershot) joins at Shoeburyness.	R.A. Woolwich v. Shoeburyness at Shoebury.	...	...
5	S	...	...	...	...
6	M	Position-finding class begins.	...	...	...
7	T	...	...	...	...
8	W	...	...	...	...
9	Th	...	...	...	...
10	F	...	...	...	...
11	S	2nd Division F.A. (Aldershot) joins at Okehampton.	R.A. Woolwich v. N.C. Officers at Woolwich.	...	...
12	S	...	...	...	...
13	M	...	...	...	'Ubique' Lodge meets of "Criterion." Installation as W.M.
14	T	...	...	...	...
15	W	...	...	...	...
16	Th	...	...	...	...
17	F	...	...	...	...
18	S	3rd Division R.H.A. (Woolwich) joins at Shoeburyness.	R.A. Woolwich v. Blackheath at Blackheath.	...	...
19	S	...	...	...	...
20	M	...	R.A. v. Greenjackets, at Woolwich.	...	...

MAY.—Continued.

Day of the

Mth	Wk.	Regimental.	Cricket, &c,	Private.
21	T	...	R.A. v. Greenjackets, at Woolwich.	...
22	W	...	...	...
23	Th	...	...	...
24	F	...	R.A. v. Aldershot Division at Aldershot.	...
25	S	1st Division R.H.A. begins at Glenbeigh. 2nd Division course begins at Portsmouth and Sandown. 4th Division F.A. (Woolwich) joins at Shoeburyness.	R.A. v. Aldershot Division at Aldershot.	...
26	S	...	...	...
27	M	...	...	...
28	T	...	Epsom Meeting begins.	...
29	W	...	Derby.	...
30	Th	...	...	...
31	F	"Chestnut Troop" Dinner.	Oaks.	...

JUNE.

1	S	5th Division F.A. (Ipswich) joins at Shoeburyness.	...	...
2	S	Whit Sunday.	...	...
3	M	Bank Holiday.	R.A. Woolwich v. R.M.A., at R.M.A.	...
4	T	...	...	...
5	W	2nd Division F.A. (Hilsea) joins at Okehampton.	...	...
6	Th	...	...	...
7	F	Annual General Meeting of R.A.I. at R.U.S.I. at 3 p.m. 2nd Division F.A. at Glenbeigh begins.	REGIMENTAL DINNER.	
8	S	6th Division F.A. (Weedon) joins at Shoeburyness.	...	...
9	S	...	...	...
10	M	...	...	'Ubique' Royal Arch Chapter meets at "Criterion." Installation of Principals.
11	T	...	...	...
12	W	...	...	...
13	Th	...	R.A. v. Quidnuncs at Woolwich.	...
14	F	...	R.A. v. Quidnuncs at Woolwich.	...
15	S	3rd Division course begins at Portsmouth and Sandown.	R.A. Woolwich v. Shoeburyness, at Woolwich.	...
16	S	...	...	...
17	M	...	R.A. v. Eton Ramblers, at Woolwich.	...
18	T	...	R.A. v. Eton Ramblers, at Woolwich.	...
19	W	...	Ascot begins.	...
20	Th	...	...	...
21	F	3rd Division F.A. at Glenbeigh begins.	R.A. v. R.E., at Woolwich.	...
22	S	...	R.A. v. R.E., at Woolwich.	...
23	S	...	...	...
24	M	...	Old Shoebury match.	...
25	T	...	Old Shoebury match.	...
26	W	...	R.A. v. Yorkshire Gentlemen, at Woolwich.	...
27	Th	...	R.A. v. Yorkshire Gentlemen, at Woolwich.	...
28	F	2nd Division (Siege) course at Lydd begins.	R.A. v. Household Brigade, at Burton's Court, Chelsea.	...
29	S	...	R.A. v. Household Brigade, at Chelsea.	...
30	S	...	...	...

JULY.

Day of the				
Mth	Wk.	Regimental.	Cricket, &c.	Private.
1	M	3rd Div. Field (Shorncliffe) joins at Okehampton.	... ..	... ..
2	T	... ..	... ..	... ..
3	W	... ..	... ..	... ..
4	Th	... ..	Oxford v. Cambridge begins.	... ..
5	F	4th Div. (Field) course at Glenbeigh begins.	... ..	... ..
6	S	Position-finding class ends.	R.A. Woolwich v. Brentwood, at Brentwood.	... ..
7	S	... ..	... ..	... ..
8	M	... ..	R.A. v. Harlequins, at Woolwich.	... ..
9	T	... ..	R.A. v. Harlequins, at Woolwich.	... ..
10	W	... ..	... ..	... ..
11	Th	... ..	... ..	... ..
12	F	... ..	Eton v. Harrow begins.	... ..
13	S	4th Div. course Golden Hill and Sandown begins.	R.A. Woolwich v. Blackheath, at Woolwich.	... ..
14	S	... ..	... ..	... ..
15	M	... ..	... ..	... ..
16	T	... ..	... ..	... ..
17	W	... ..	... ..	... ..
18	Th	... ..	R.A. Woolwich v. West Kent at Woolwich.	'Ubique' Mark Lodge of Mark Master Masons meets at "Criterion." Installation of W.M.
19	F	... ..	R.A. v. R.E., at Chatham.	... ..
20	S	... ..	R.A. v. R.E., at Chatham.	... ..
21	S	... ..	... ..	... ..
22	M	... ..	R.A. v. Gentlemen of M.C.C. at Lord's.	... ..
23	T	... ..	R.A. v. Gentlemen of M.C.C. at Lord's.	... ..
24	W	... ..	... ..	... ..
25	Th	... ..	... ..	... ..
26	F	4th Div. Field (Colchester) joins at Okehampton.	R.A. v. Free Foresters, at Woolwich.	... ..
27	S	... ..	R.A. v. Free Foresters, at Woolwich.	... ..
28	S	... ..	... ..	... ..
29	M	... ..	... ..	... ..
30	T	... ..	Goodwood begins.	... ..
31	W	... ..	... ..	... ..



PRÉCIS
AND
TRANSLATION.

THE FIELD GUN OF THE FUTURE,

AS PROPOSED BY

GENERAL WILLE AND HIS CRITICS.

TRANSLATED BY

CAPTAIN H. A. BETHELL, R.A.

October 1893.

(Continued from p. 8, No. 8, Vol. XXII.).

PART III.

General Wille remarks on the table given below:—

(1.) Mr Bender's gun with its low velocity is a very weak shooting affair, and its practically impossible shrapnel of $26\frac{1}{2}$ lbs. puts it out of count.

(2.) This is only a H.A. gun. As such it is far superior to the English 12-pr.

(3.) Colonel Langlois' is a quick-firing gun and as such useless and impossible. Its ballistics are very poor.

(4.) No comment on Colonel de Sotomayor's gun.

(5.) Mr. X.'s gun is an enfeebled edition of Captain Moch's.

(6.) Mr. C.'s gun is intended to be a quick-firing gun with shield mounting. In his pamphlet he gives no idea of how this is to be carried out, and how he proposes with an energy of recoil amounting to 8·8 foot tons¹ to prevent his carriage from running back—especially as he objects to hydraulic buffers! His gun is to be of steel or aluminium bronze, his shield of chrome steel and aluminium and his metallic cartridges of the same metal.

Mr. C. is not apparently aware that aluminium, like its alloys, rapidly loses strength with increase of temperature. It is quite unsuitable for gun construction and has so far proved a complete failure as cartridge metal.

It should be noted that Mr. C.'s "battery" consists, in addition to 6 guns, of two mortars and 6 machine guns. Comment is needless.

(7.) Captain Moch's designs are both powerful guns, far in advance of anything now existing. The $18\frac{1}{2}$ lb. shell of the first gun is too heavy and the second design is preferred.

The annexed table of field guns proposed as rivals to General Wille's designs will be of interest.

¹ C.f. 12-pr. 5·07 foot tons by same formula.

THE FIELD GUN OF THE FUTURE.

AS PROPOSED BY VARIOUS MODERN WRITERS.

Proposed by :—	Mr. Chas. Bender, C.E.	Mr. J. Longridge, C.E.	Colonel Langlois	Colonel de Sotomayor.	Mr. X.	Captain Moch.	Mr. C.	Captain Moch, II.	Mr. J. Longridge, II.	General Willé.
Calibre inches	3.46	3.07	2.91	3.27	3.15	3.15	2.95	2.95	3.07	2.76
Weight of Shrapnel, lbs.	26.45	16.13	11	16	16.53	18.37	15.43	15.43	16.13	14.33
Weight per square inch of cross section, lbs.	2.79	2.26	1.65	2.13	2.12	2.36	2.25	2.25	2.26	2.39
Muzzle velocity, f.s.	1312	1529	1608	1673	1883	1939	1968	2120	2175	2625
Weight of gun, cwt.	8.7	4.0	—	6.89	8.3	8.4	7.9	8.4	7.9	7.9
Weight of carriage, cwt.	10.0	9.0	—	9.3	—	10.5	10.9	10.5	11.2	10.9
Weight of gun and limber, M.O., no detachment, cwt.	35.3	—	31.5	32.0	—	31.75	35.3	31.75	—	35.3
Length of gun, feet	8.9	4.5	—	8.5	7.5	7.5	8.9	8.5	6.3	9.2
Highest powder pressure per square inch, tons	7	18	—	9.3	14	18	—	18	20.7	25

Neither design satisfies General Wille, who considers that Captain Moch has not taken full advantage of the strength of his materials.

(8.) Mr. Longridge, in his second design, has arrived at the same estimate of strength of materials as General Wille.

His gun is shorter and stouter, and his powder pressure of 29·7 tons gives almost exactly the same strain on the metal as General Wille's 25 tons. As previously pointed out, General Wille considers his gun too short for nitro-powder, his muzzle velocity too low, and his shell too heavy.¹

(9.) Taking the average of the foregoing table, omitting Mr. Bender's 26-pr. and Colonel Langlois' quick-firing gun, and comparing the result with existing field guns, we note a large increase in power, velocity, density, and powder pressure, and a decrease in calibre.

(10.) Next follow some notes on the highest velocities experimentally attained by various gun-makers :

Canet...	...	...	2·42 inch gun 1892,	3323 f.s.
Canet...	...	...	3·9 "	3366 "
Elswick	...	...	6 "	1893, 3707 "
French Government	6·3	...	...	3983 "

Shewing that General Wille's 2625 f.s., is not so extravagant after all.

(11.) The flat trajectory is objected to on three rounds :

- (a.) Danger to one's own troops in front.
- (b.) Want of searching powder of shrapnel against troops under cover.
- (c.) The enemy will be safe on the reverse slope of a hill, as shell clearing the ridge will go clean over him.

General Wille replies:

(a.) There is no question of the shell itself striking troops in front, as even at 100 yards the trajectory is about 9' 6" above the ground when firing at 2000 yards. As for premature bursts, a few degrees of elevation more or less will make no possible difference.

(b.) The lowest velocity field guns now existing give an angle of descent of only about 6° at 2000 yards. This is quite insufficient for searching entrenchments with shrapnel. Such work will have to be done with high explosive shell.

(c.) Obviously the fire is most effective when the trajectory is parallel to the reverse slope of the enemy's position—that is when the angle of descent is equal to the slope of the ground. Practically, unless you get a ridge like the roof of a house, at ordinary ranges the slope is always less than the angle of descent, and the flatter the trajectory the better.

(12.) The high pressure in the bore (25 tons per square inch) to which many critics object, is no higher than that of the French 4·7" and 5·9" quick-firing guns.

A 5-inch gun tried at Birdsboro', U.S., in 1892 stood 26½ tons without injury.

The new nickel-steel gun ordered by the American Government is to have a powder pressure of 20 tons to the square inch. The steel specification is as follows :

A tube :—	Elastic limit	18·75 tons,	breaking strain	38 tons,	extension	20 per cent.
Jacket :—	"	20 "	"	40 "	"	18 "
Outer hoops :—	"	24·5 "	"	45 "	"	16 "

¹ Other things being equal this weight gives 90 rounds per sub-division against General Wille's 102.

(13.) Various critics have doubted the possibility of using gun steel up to an elastic limit of 25 tons per square inch.

The French Canet quick-firing guns are now (1892) made of steel to the following specification :

Elastic limit 25·5 tons, breaking strain 43·8 tons, extension 16 per cent.

This steel is made at St. Etienne, Firming and Havre.

For the experiments at Obuchoff, the Russian Government have ordered a 4-pr. gun with an *A* tube up to 26·7 tons elastic limit.

(14.) Regarding the possibility of making a gun to stand the premature burst of a high explosive shell without flying to pieces, General Wille cites the following experiments of Krupp's, carried out 14th October, 1892 :

A shell containing about $\frac{1}{4}$ lb. of picric acid was exploded in a $3\frac{1}{2}$ inch gun of ordinary steel at 1 foot from the muzzle. The muzzle was cut clean off and the metal round the shell blown into small pieces. The same experiment was then repeated in a similar gun of nickel-steel. The result was a bulge of $\cdot 3$ inch at the point of explosion. No crack could be detected. A second picric acid shell was then burst in the chamber of the same gun, causing a bulge of $\cdot 37$ inch and a hair crack 3 inches long. In neither case was any portion of the steel separated.

(15.) The process of hardening (not tempering) high steel in melted lead is said to have given good results. Comparative trials shew an improvement on the oil-hardening process of 6·6 per cent. elastic limit, 11·8 per cent. breaking strain and extension no less than 38·4 per cent.

(16.) The Swiss Government have just given notice of a competitive trial for the selection of the new field gun for their army. The conditions laid down are :

Calibre—2·76" to 3·3".

Density—To be as high as practicable.

Muzzle velocity—With partly arrested recoil, not under 1640 f.s.

„ „ With completely „ „ 1500 „

Breech action—Quick-firing.

Obturation—By means of a metallic cartridge.

Buffer and brake—So far as possible to arrest the recoil that the gun has not to be laid afresh.

Number of rounds carried—36 to 40 in the limber for the 3·3" gun, or more for smaller calibres.

Weight, marching order, without detachment—not over $35\frac{1}{2}$ cwt. for the 3·3" gun.

General Wille remarks : I do not believe it possible to completely arrest recoil with a muzzle velocity of 1500 f.s., and a shell of respectable weight.

So far, however, as regards the gun with partly arrested recoil, the conditions seem very fair.

(17.) The Russian Government have ordered 3 quick-firing field guns, and intend to carry out a competitive test between them.

These are : A 3·13" quick-firing from Gruson.

„ 2·95" „ „ Nordenfeldt.

„ 2·95" „ „ St. Chamond.

A varied and thorough trial is to be carried out, and the successful gun must possess good ballistics and the practical qualities of a serviceable field gun.

General Wille, as before said, objects on principle to quick-firing field guns.

(18.) It is not stated whether the Nordenfeldt 2·95" quick-firing ordered

by Russia is identical with the Nordenfeldt quick-firing tried at Leraing in Belgium. This has the following remarkable points :—

The trunnions of the gun are vertical, those of the top carriage horizontal.

The gun recoils 1 foot on the top carriage. It is connected by a chain to a fixed hydraulic buffer, and to springs which return it to the firing position.

The gun itself has a friction brake (besides the carriage brake) to which it is connected by toothed wheels.

The carriage has a peculiar tire brake. The brake blocks revolve with the wheels till they touch the ground, when they become drag-shoes and finally inclined planes down which the gun runs forward. There is a spur or earth-plate under the point of the trail. The elevating gear recoils with the gun.

The limber has no boxes, but has 8 aluminium portable magazines weighing empty 4 lbs. each and holding each 6 rounds.

The gun and limber weigh $33\frac{1}{2}$ cwt. without M.O. kit or detachment.

There are 9 ammunition wagons, and the battery carries 273 rounds per gun.

The shell weighs 10·4 lbs. smokeless powder, and the m.v. 1500 f.s. The density of the shell is only 1·5 lbs. per square inch of cross section.

When fired, the gun carriage moved only a few inches backwards or forward, and the laying required only a slight correction after each round. This result was not considered quite satisfactory and “anchors” are now to be added outside each wheel.

General Wille remarks : This gun bears out what has already been said about the impossibility of making a good quick-firing field gun. Everything possible has been done to make it answer—the carriage is a mass of elaborate machinery—and the result is a field gun weaker than anything ever made before. The ballistics of the gun are simply contemptible—for instance, the angle of descent at 3000 yards is over 11 degrees—and the gun is merely a small-bore field howitzer.

(19.) Colonel von Wuich of the Austrian Artillery is considered a high authority on the Continent, and General Wille discusses his essay on the future field gun in a separate chapter. He begins by demanding a light field howitzer, to fire over the heads of one's own troops and to search cover and entrenchments.

On this General Wille remarks that a light howitzer is only a toy, that the flattest field gun trajectory will clear infantry 100 yards from the muzzle, and that as cover and entrenchments can be effectively searched by field guns firing high explosive shell, it is not worth while to encumber the army with special howitzer batteries requiring special ammunition trains, which would only occasionally be of use.

Colonel von Wuich then proceeds to describe his ideal field gun.

This is to possess a high m.v. and density of projectile, giving a flat trajectory, in order to reduce the importance of errors in estimating range. It must further possess great mobility and rapidity of fire.

Muzzle velocity 1970 f.s., weight of shell about 17 lbs., calibre not determined, probably about 3·15 in.; pressure in the bore at least 20 tons per square inch. Weight of gun and limber, marching order, $35\frac{1}{2}$ cwt.

Ammunition to consist of shrapnel and high explosive shell, case shot to be abolished. All shell to have fixed time and percussion fuzes. Metallic cartridges objected to. Smokeless powder. Gun to be either of nickel-steel or possibly of improved bronze.

Carriage to have a separate top-carriage and a muzzle traversing arrangement. Recoil to be checked, not stopped, by brakes. The elevating gear must allow of fire at considerable angles, as it may often be necessary to fire at balloons.

Though on minor points General Wille differs from Colonel von Wuich, he

considers his system generally sound and his opinions deserving of the highest respect.

(20.) The new Russian field mortar is a 6-inch B.L. mortar on an iron bed. It fires a 68 lb. shrapnel containing $683\frac{3}{4}$ oz. bullets, or a 60 lb. common shell. The battery consists of 36 carriages, including 18 ammunition wagons and 6 ammunition carts, carrying 92 rounds per mortar.

The battery fires about 3 rounds of shrapnel per minute.

As the result of various experiments, the Russians consider their mortar superior to their own or any existing field gun, and Captain Schubert compares it to the English 12-pounder, much to the disadvantage of the latter. General Lewitzky proposes to equip the Russian Horse Artillery with it!

General Wille points out that the above comparative trials were carried out at dummies in entrenchments of strong profile at which the Russian field guns had no chance at all. A more powerful field gun firing high explosive shells would give a very different account of itself. For Field Artillery work proper and much more for Horse Artillery work, the mortar battery with its 36 carriages is altogether too clumsy.

Fancy a Horse Artillery battery obliged to dismount its mortar beds in order to come into action, and with the shell brought up to the gun in a two-horse cart! Moreover, on tactical grounds a 68 lb. field shell is inadmissible.

In the trials above described the mortar battery took from 8 to 12 rounds to range itself—and that at known ranges at conspicuous standing objects. A waste of a dozen 14 lb. shell would be bad enough, but a waste of a dozen 68 lb. shell at every fresh range before effective fire commenced would be more than any ammunition column could stand. As moreover the rate of fire is only 3 shrapnel per minute, the enemy would not improbably move off before the completion of the ranging series. The extreme range of the mortar is only 3300 yards, and a field battery at 3500 yards firing at a target like the mortar battery with its 36 carriages would have a very enjoyable time.

(21.) Captain Kuczera finds fault with General Wille for wasting argument on people who still believe in field howitzers. General Wille replies in effect that since there are such people—and clever people too—it is his duty to make them see the error of their ways.

(22.) Comparative trial of Krupp's new $6\frac{1}{2}$ lb. quick-firing gun against a 3.15" field gun.

This is too long to transcribe.

General Wille admits that the quick-firing equalled the field gun in hits per pound of shell, and beat it by 3 to 1 for time. He contends however that the field gun was an old and comparatively weak one, that the target (three rows of screens 9 feet high and 20 yards behind one another) was not a service one, and that the trial took place at known ranges. At a service target such as successive lines of attacking infantry the little quick-firing gun with its narrow zone of shrapnel effect would have no chance against a powerful field gun. As for time, the field gun fired 2 rounds per minute, and this rate, equal to 12 rounds per minute for a battery, General Wille considers quite sufficient for practical purposes.

A further conclusive objection to the use of shell so small as $6\frac{1}{2}$ lbs. is their want of effect against entrenchments, and the impossibility of getting a sufficiently large high explosive burster into them.

General Wille gives long extracts from articles on this trial by various eminent military writers to much the same effect.

(23.) A summary of the opinions of eleven critics for and against metallic cartridges and fixed ammunition. A small majority vote for metallic cartridges separated from the shell. Metal is preferred because nitro powder keeps better

in metal than in silk, and because there is no danger from burning fragments left in the bore.

General Wille says the question will have to be decided by experience.

(24.) With respect to the gun carriage twice mentioned by General Wille, which stood a number of rounds with a recoil of 14 tons without injury Captain Kuczera objects that this must have been a brand new carriage, and that no carriage weakened by travelling would stand it. General Wille replies that over 1000 rounds had been fired from it, and it had done various marches and more than one railway journey.

(25.) *The Du Bange anti-recoil spur.*—The end of the trail is bent parallel to the ground for about 2 feet, and contains a hydraulic buffer and spring. To this buffer is connected a spur or spike driven deep into the ground. On firing the carriage runs back but the spike stands fast, and the buffer spring, compressed during the recoil, brings the carriage to the front again to its original position. On hard ground the spike is not used, but is taken off and hung on the limber.

The spur brake is objected to as causing violent and irregular jump.

(26.) The anchor brake is a grapnel with spring shank. It is fixed in the ground in front of the gun and connected by chains to the breast of the carriage.

It is said to have been tried at Calais and to have stood 250 rounds without giving way.

With respect to this as to the spur brake, General Wille objects that it can only be used on favourable ground. The Grüson buffer carriage which reduces the recoil to 2 feet, is good enough for him.

(27.) *Various opinions for and against armour shields.*—General Wille reckons that a shield would weigh 250 lbs., would demoralize the gunners and would make a handsome target and a screen for the enemy to burst his shrapnel on. The gunner's best defence is the superiority of his own fire.

(28.) *Changes in War Material since '91.*—Germany had added one ammunition wagon per battery and reduced one store wagon.

Common shell have been done away with, and shrapnel with fixed double action fuzes introduced. The high explosive shell have been improved.

Austria has introduced a light Horse Artillery gun and has equalized the weights of common and shrapnel shell.

Other nations have made no progress.

REMARKS BY TRANSLATOR.

With the exception of the field howitzer man, none of the critics seem to take exception to General Wille's main principles. They all seem to agree with him about deep zone of shrapnel effect, high velocity, flat trajectory, and great power. But besides the various objections to details, there seems to be a general idea that he has over-estimated the strength of his materials, and that his gun will burst or his carriage collapse. As regards the pressure in the bore, the critics have a trifle the best of it, and he is practically driven to admit that his gun cannot be made out of ordinary gun-steel. My own view, if I may be exercised for putting it forward, is that if General Wille trusts to shrinking one tube on another to equalize the strain on his metal, he will find himself mistaken; and further that his factor of safety for nitro powder should be doubled at least. Most of us who use E.C. and Schultze are familiar with the violent cartridges that occasionally occur in the best shooting batches. I think General Wille will have to put another hundredweight on to his gun, preferably in the shape of wire. As for the material of his tube and jacket, it is clear that "low" gun-steel will not do; the question is whether "high" steel—say with an elastic limit of 40 tons and a breaking strain of 80—can be used or no. Such steel, if required, could

be supplied easily enough, and I have no doubt that it can and will be used for guns. Twenty years ago we made our guns of wrought-iron because we would not trust steel; now we use low steel because we will not trust high steel. Surely it is time we tried a step in advance? If we made our guns of the same steel as our swords there would be no difficulty in attaining to General Wille's requirements.

Several of the details of his scheme will not commend themselves to English gunners. His metallic cartridge cases would be an awful nuisance in our service; we should probably make the limber-gunners burnish them. As for his patent nave-brake, we have tried nave-brakes, tire-brakes and automatic brakes till we are about sick of them. It rather upsets the Major's nerves when he sees No. 1 gun waltzing round or running at him with open mouth because one side of the machinery has gone wrong. Now that we have got the drag-shoe I hope we shall stick to it.

The number of rounds per gun (102) will seem to most people too small.

This is based on the numbers actually fired in the Franco-German War. It might be argued, however, that if the German captains had had more ammunition, they would have fired faster. I can imagine a C.O. economizing his ammunition when he ought to be at "rapid fire" for fear of emptying his boxes and being out of it in the next day's fight. I should add 3 more wagons and bring the number up to 138 per gun.

I am afraid that in the foregoing précis I have left out many of General Wille's best "points," for which I hope he will forgive me. Among others I do not think it has been explained that at short ranges up to say 1500 yards the new gun will practically require no ranging. You have only to get a 400 yards bracket in the first two shots, and you can start time fuze at once, at the mean elevation; since a correction of a 100 yards will make no practical difference in the height of burst. Similarly the fuze will give no trouble, since it is simply set to the range and corrected by altering on the fuze key the distance short of burst.

The superior way in which the French and German critics refer to our 12-pounder as an example of "how *not* to do it" is not calculated to increase our good opinion of ourselves. Perhaps as a 15-pounder it will please them better. If there is any truth in the proportion of weight to muzzle energy laid down by General Wille, Colonel von Wüch and other authorities mentioned above, it ought to stand a m.v. of 2000 f.s. with a 15-pounder shell. That would be something like a field gun!

The following figures relating to General Wille's gun, worked out by the English formulæ, may be of interest:

RANGE TABLE FOR 2.76" B.L. GUN.

Projectile, fuzed shrapnel, weighing 14.33 lbs. Charge 3 lbs. cubical smokeless powder. Muzzle velocity 2625 f.s.

	1000 yards.	2000 yards.	3000 yards.
Remaining velocity f.s.	2137	1750	1425
Angle of elevation	0° 26½'	59'	1° 40'
Slope of descent	$\frac{1}{105}$	$\frac{1}{39}$	$\frac{1}{19}$
Angle of opening of sprapnel ¹	9° 28'	10° 20'	11° 24'
Depth of zone of effective shrapnel bullets, } yards	765	726	602

¹ General Wille gives Δv due to 4 oz. burster = 260 f.s.

PRÉCIS
AND
TRANSLATION

FROM THE
“REVISTA DI ARTIGLIERIA E GENIO.”

Ottobre e Novembre, 1894.

FORTRESS WARFARE.

TRANSLATED BY
MAJOR R. M. B. F. KELLY, R.A.

La Guerra di Fortezza (L'azione dell Artiglieria) E Rocché maggiore, del Genio.

1.—ORGANIZATION.

The defences of an important fortress should be organized in concentric lines each one within artillery range of and under the fire of the guns of the next inner line. The lines would be (1) the enceinte of the central nucleus or town or position to be defended; (2) the main line; (3) the advanced line. In addition there would be a second or retired line forming a chord between two points in the main line.

These external lines should follow wherever possible the crest line of a ridge or series of ridges, and an interior line should if possible have command over an exterior one—*vide* Fig 1.

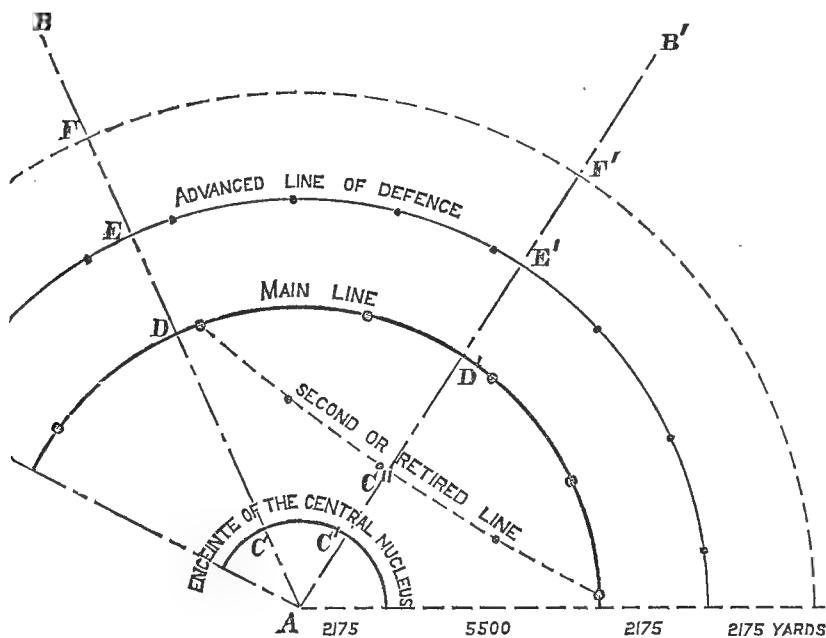
Functions and defences of the various lines.—The external line should virtually be a carefully selected site or sites on which a defensive battle would be fought before the mobile portion of the garrison withdrew behind the main defences, and before the place could be regularly invested. The defences of this line would be obtained by placing the existing features of the country between the 2000 to 3000 yards zone from the main line, woods, farm-houses, villages, streams, and the like, in a state of defence; and by constructing such trenches and field-works as might be necessary.

The function of this line is to force the enemy to fight a pitched battle and to win a carefully prepared defensive position before he can invest the fortress or commence his siege operations.

The main line of defence should consist of a chain of permanent forts, capable of giving each other mutual support and connected by lines of trenches, with gaps for the withdrawal of the mobile army when forced to fall back. The great bulk of the defensive artillery would be placed in these intervals in *quasi* siege batteries. The position and character of the defences for the advanced line and for the intervals in the main line having been carefully decided on in time of peace the works

would be carried out as soon as it was determined to place the fortress in a state of defence.

FIG. 1.



Scheme of Defensive Arrangements for a large Fortress.

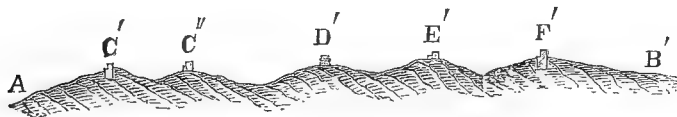
• Permanent works.

• Field and improvised works.



Section on the line A B.

Case of level unaccentuated ground.



Section on the line A B'.

Hilly accentuated ground.

The functions of the main line of defence are—

(1.) By the fire of its guns to support the mobile army in the defence of the advanced position.

(2.) To offer an obstinate resistance after that army has been defeated and driven in.

(3.) To protect the central nucleus from bombardment.

This main line may be said to form the tracing of a gigantic polygon in which the permanent forts form the bastions and the lines in the intervals the curtains.

The lines in the intervals should follow the crest line of a ridge or ridges and the forts be constructed on commanding points on these ridges.

The functions of the enceinte or defences of the central nucleus is to guard it, *i.e.* the town or city defended, from capture or raid by small parties who having penetrated the main line at some point have pursued their advantage so far, and to make it a place of refuge secure against a *coup de main*.

For this purpose a slight profile formed by a ditch 13" to 14" deep and 13 to 16 yards wide with a parapet 33" to 39" thick having a command of from 16" to 20" would suffice.

The second or retired line can only be fixed when the besieger has made clear which face of the fortress he means to attack.

This line should form a chord to the face of the main line under attack and should extend between two permanent forts in that line not themselves under attack but on the flanks of the attacked arc—the defences of this line should be similar to those in the main line but necessarily of a slighter and more temporary type. Field-works erected on prominent points would take the place of the permanent forts in the main line. Possible positions for such work should be fixed in time of peace and the size and character of the works decided on, the functions of this second line are to provide for the continuity of the defence even after any particular section of the main line has been pierced or rendered untenable to prevent a successful attack on the main line being immediately followed by the fall of the place and to facilitate the withdrawal of troops and *matériel*.

The functions of the forts of the main line are to command by the fire of long range guns the country over which the besieging army must manœuvre to attack the defensive position; to support the mobile army in the defence of that position; to provide these guns with efficient defences which can only be rendered untenable by a deliberate bombardment from comparatively short ranges, and to afford such flanking protection to the intervals that these would be secure from assault till more than one of the forts had been silenced.

II.—DEFENCE.

Armament.—A greater diversity of types and calibres is admissible and even necessary in the armament of a fortress than in that of a siege-train. And the armament of a 1st class fortress should include the following types :

(1.) A few long range guns to act against the investing columns at a distance, to oblige the assailant to place his park or dépôt at a maximum distance, to render the task of arming the siege batteries and the supply of ammunition arduous and perilous, and to give material support to the mobile portion of the garrison in their defensive battle and during the other preliminary operations.

Long range can only be obtained at the expense of lightness and mobility, but as these considerations are not in all cases so essential for the defence as for the attack the former would surrender an important advantage if it did not include some long range guns in its armament. These guns should be invariably placed in the forts of the main line, they will act by direct fire and should be aimed by direct visual laying. They should if possible command all the “terrain” included in their arcs of fire which should be as large as possible—should be placed behind defences proof against high explosive shells—and their magazines and shelters should be similarly protected.

(2.) The remainder of the armament need not be superior in calibre to that advocated for siege-trains. As the bulk of the armament should be distributed in the intervals between the forts, mobility becomes a desideratum, and as the defences of siege batteries must necessarily be slight, powerful guns are unnecessary, howitzers of about 5·8” calibre and medium mortars¹ are recommended as most suitable for indirect or curved fire, the destruction of overhead cover, &c.

(3.) The flanking of the batteries and trenches in the intervals and the immediate defence of the forts themselves should be secured as far as possible by light and quick-firing guns on disappearing mountings in the forts—these guns should have a command over the “terrain” in the immediate vicinity of the forts and over the intervals between themselves and the neighbouring forts on either flank.

(4.) In addition to the above there should be a proportion of light mobile guns and howitzers of about 3·5” calibre. Rapidity of fire is absolutely essential

¹ By mortars are meant rifled howitzers mounted at fixed angles of elevation.

to the defence, and as their supply of ammunition should be practically unlimited, they must utilize this advantage by rapidity of fire, and this rapidity must be sought not only by employing light guns but also by the use of fixed ammunition and short recoil mountings.

The armament of a fortress may be classified as under—

(1.) *Protective armament*—consisting of guns permanently mounted in the forts of the main line. These guns are thus always ready and can join in the defence at the very outset—they include the long range guns mentioned above—strongly protected and even some in armoured revolving towers; quick-firing and other light or medium guns and howitzers for the immediate protection of the forts themselves, and for flanking purposes, mounted on disappearing mountings.

(2.) *Defensive armament* consists of the ordnance which it is intended to place in position as soon as it has been decided to put the fortress in a state of defence, these guns, &c. would be distributed in the intervals between the forts, in batteries of the nature of siege batteries.

(3.) *Reserve armament*.—This armament is intended to reinforce the face or position attacked and could only be placed in position when that is known; the batteries composing it would be told off to the main and second or retired lines respectively.

(4.) *Mobile armament* consists of field and mountain batteries intended to accompany the mobile troops of the sectional or general reserve and to support their operations.

Placed behind epaulments they would assist in the general defence of the various lines, and form a reinforcement to the regular armament of the fortress.

It has been said above that the bulk of the armament would be placed in the intervals between the forts and that these interval lines should follow the topographical crest of a series of ridges.

These batteries should be arranged and in three *échelons*, the first on the crest line should consist of medium and small calibre guns for direct fire, they should have a command of fire and view over the ground in front, they are for direct fire and should be aimed by direct visual laying; the second *échelon* should be placed a little behind the crest line or on high ground to the rear not commanded from the front, and should consist of medium and fairly large calibre guns with flat trajectory for direct fire; the third *échelon* should be on the reverse slope and should consist of medium and large calibre howitzers in concealed batteries for indirect fire by indirect laying.

Defence of the advance line.—The protective armament placed in the first and second *échelons* of the intervals should endeavour by direct fire to silence the besieger's guns charged with the duty of preparing for the assault on the advanced line, the careful organization and the superior means of observing fire at the disposal of the defence should ensure a superiority of fire. The long range guns in the forts would prevent the enemy from bombarding the advanced position from close quarters and would support the troops engaged in the defence of that position. The light mobile guns in the advanced position would support the infantry in its defence and cover its retreat.

Carefully arranged lines of obstacles would add to the efficiency of the artillery fire from the main line of defence by delaying the attacking columns. Wire entanglements, owing to the comparative immunity they enjoy from destruction by artillery fire, form the best kind of obstacle—they should have a depth of from 200 to 300 yards—with intervals 400 to 600 yards wide at certain known points to allow the defenders to fall back through them.

Defence of main line.—Artillery combat—the main burden of the defence during this phase will fall on the third *échelon* of the defensive armament, *i.e.* those howitzers placed in concealed batteries on the reverse slopes of the ridge. From

these batteries the fire would be indirect, means of laying indirect, observations of fire from some points on the crest line, nature of fire curved fire with high explosive shell for the destruction of overhead cover and indirect shrapnel for searching effect. The advantage gained by using this *échelon* is that the batteries are protected and concealed and can only be touched by curved fire.

The heavy long range guns from the forts would support these batteries by direct fire.

The guns and howitzers of the 1st and 2nd *échelons* should be used to repel assaults, and to harass working parties and would be assisted by the flanking fire of the guns mounted for that purpose in the forts.

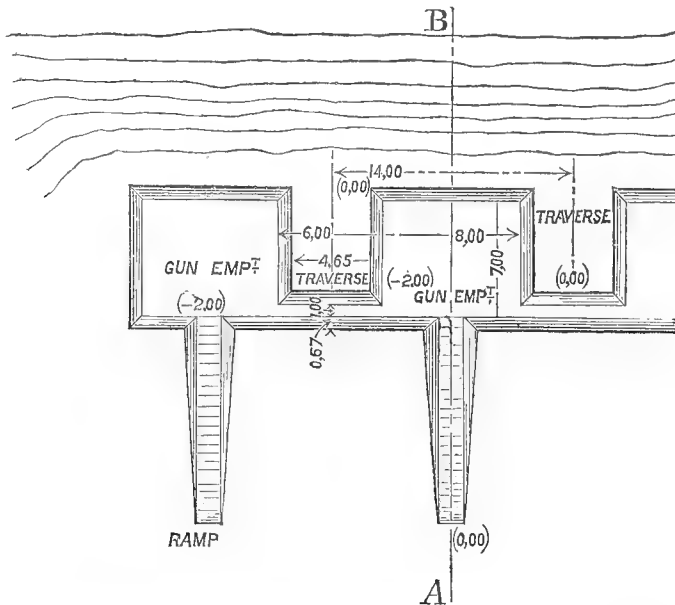
The section of the main line under attack would be reinforced by guns, &c. from the reserve armament, and during this phase of the siege the second or retired line should be placed in a state of defence and armed. The distribution of its armament and the organization for its defence would be similar to that of the main line. The *points d'appui* of this line must necessarily be of the nature of field-works and their armament less formidable than that of the forts in the main line.

Construction of batteries for defensive and reserve armament.

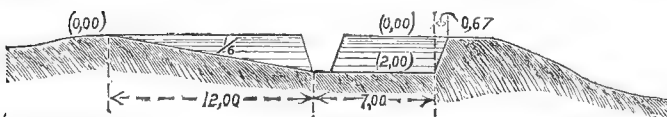
(1.) Batteries on the crest line (1st and 2nd *échelon*).

Sunken batteries are preferable—1st because the parapets and traverses are formed of undisturbed earth and are therefore stronger; secondly, the natural contour of the ground is not interfered with and the batteries are consequently less conspicuous; and thirdly, because the desired amount of protection can be obtained in a shorter time. The *déblai* should be scattered along the front in such a way as to conform to the folds of the ground and to aid in the concealment of the battery. Fig. 2 shows such a battery, the measurements being in mètres and

FIG. 2.



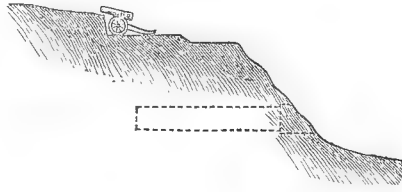
Construction of the Batteries. Scale $\frac{1}{500}$



Section on the line A B.

decimals, for four emplacements this battery would require in ordinary soil 100 men working eight hours.

FIG. 2a.



The magazines should be in excavations outside the batteries, niches for the reception of a few rounds being excavated near each gun.

Local circumstances may prevent such batteries being constructed.

(1.) The configuration of the ground may necessitate more command than can be obtained from a sunken battery.

(2.) Water near the surface or a very soft subsoil would oblige the guns to be placed on unbroken ground.

(3.) A very rocky ground might render excavation too laborious, in this case the conformation of the ground might admit of the guns being placed as shewn in fig. 2a.

Whenever a sunken battery is excavated in rock the danger of splinters from the rear face of the emplacement must be guarded against, the slope of this face should not be too steep and, if necessary, the length along the line of fire of the emplacement should be increased, the extra space being filled up with earth at a slope of $\frac{1}{4}$ or $\frac{1}{6}$ from the ground level to the floor of the emplacement. Whenever it is necessary to protect batteries by raised parapets owing to the nature of the soil, difficulties of drainage, &c., it will be impossible to conceal them from view, but observation of fire by the enemy must be rendered difficult by the employment of natural or artificial screens or masks. Lofty trees form the best screen, especially if planted in suitable rows, the distance of such a screen from the battery must depend on the height of the trees, local considerations, &c., but it should be at some considerable distance (100 to 300 yards).

In default of natural screens recourse must be had to masses of earth, here again no exact distance can be laid down, but in any case it should not be less than the length of the 50% zone for the guns likely to be employed against it at the shortest probable range.

When the position of the batteries is commanded in such a way that it is not possible to screen them, the position of the guns may be concealed by a cloud of smoke from fires lighted in suitable positions and fed with resinous, smoke-giving fuel.

Concealed batteries (3rd echelon). These batteries being constructed on the reverse slope will only require overhead cover and the magazines can be placed close to the batteries. The arrangement of such batteries being reduced to the utmost simplicity will facilitate the rapid instalment of such ordnance as may at any time be required at any particular spot, whether for offence or defence. When the features of the ground are not acutely marked the positions of the batteries must be masked by screens as recommended above; finally, if it is impossible to utilize any of the above methods to protect and screen the batteries, recourse must be had to armoured protection.

The advantage of armour for the protection of important guns mounted in the permanent forts is undisputed, but its employment for the protection of batteries placed in the intervals presents many difficulties. Shields for the protection of siege batteries formed of layers of plates of the aggregate thickness of 5.85" have been tried, and it is not impossible that the employment of more powerful shields

may be found practicable, but the solution of this question is more likely to be found in the use of armoured mountings, such as that made by the Gruson firm for a 4·58" quick-firing howitzer 13 calibres long, weighing with the howitzer (of 1100 lbs.) under 40,000 lbs. (about 18 tons). It is in 19 sections, the heaviest of which, the cupola, weighs about 4500 lbs. (about 2 tons). It was found that six men including one fitter could put the whole together and mount the gun in a little over two hours.

The comparative mobility of such mountings and the facilities they afford for working the gun will render their employment possible not only for the defence but also for siege guns, on the other hand their cost (£3600 for the mounting mentioned) will prevent their being very generally employed.

III.—THE ATTACK.

Nature of siege-train armament.—The number of different calibres and types of ordnance in a siege-train should be restricted as far as possible. Howitzers and rifled mortars should have the same calibres as guns so that the same projectile might do for both.

The bulk of the armament should consist of not more than 3 calibres; those adopted by most countries being about 5", 6" and 8" with two supplementary natures, viz. a light gun of 3·7" and a heavy mortar of 10·5"

The 5" usually consists of guns only, the 6" of guns and howitzers, the 8" of guns, howitzers and mortars. Guns of 8" should be regarded as exceptional pieces and only form part of a siege-train for the reduction of works of a very exceptional character.

A siege-train should be organized in sections or *déchelons*, each section comprising all the ordnance required for some particular phase of the siege of a first-class fortress or for the reduction of a place of minor importance. In France the siege-train is divided into six sections of which No. 1 is the light or auxiliary siege-train, it is separate from and independent of the siege-train proper—every Continental Power has some such organization, supplementary to the siege-train proper—its function is to accompany the besieging army—from its mobility it can be brought into action at once and would prepare the way for the assault on the advanced line.

The French light train includes 16 howitzers of 6" and 8 mortars of 8·5" throwing shell with a bursting charge of 26·4 lbs. and 67·4 lbs. respectively (rather heavy ordnance for a light siege-train!)

Sections 2 to 5 comprise the siege-train properly so called, section 6 includes a mortar of 10·5" and a gun of 8·5", exceptional pieces only required for the reduction of unusually powerful defences. Siege-trains and parks should usually be stored in frontier fortresses. The special light siege-train should form part of the reserve armament of such fortresses so as to be equally available for offence or defence. As to the number of pieces of ordnance required for the reduction of a first-class fortress there is a great difference of opinion, the numbers given varying from 200 (General Saurer) to 700 (General Brialmont), 400 may be taken as a mean. While as to the best proportion of different natures of ordnance no recent standard has been fixed, the old standard was 55% guns, 20% howitzers and 25% mortars. The increased accuracy of curved fire would tend to diminish the proportion of guns and increase that of the other two classes.

Ammunition supply.—The weight of ammunition expended at the sieges of the undermentioned places was—

Strasbourg 31 days' siege	...	...	...	4000 tons.
Paris 62	"	"	...	2500 "
Belfort 73	"	"	...	1800 "

These figures will probably be much exceeded in future, and the probable amount has been estimated at—

Preliminary engagements and investment	...	...	1000 tons.
Attack of advanced line...	...	...	2000 "
„ main „	...	...	4000 „
„ second „	...	...	2000 "
„ central nucleus	...	...	2000 "
			<hr/> 11000 tons.

This would give from 1000 to 1200 rounds per piece, of which 200 to 300 rounds would form the first instalment which should form part of the equipment of the siege-train and accompany the guns themselves.

Both for the arming of the batteries for the heavier natures and for the supply of ammunition, a light railway is an indispensable adjunct to the *matériel* of each section of a siege-train. The want of it was severely felt by the Germans at the siege of Paris. On the 9th November, 1870, 45000 quintals (of about 100 lbs.) were wanting to complete the first supply of ammunition for the siege batteries, this had to be brought up by cart from Nanteuil to Villa Coublay, 4 days' journey—8 days for going and returning—allowing 15 quintals per cart, this would have taken 1000 carts 24 days to accomplish, instead of that only 500 or 600 were available and the roads were so bad that they could only take from 10 to 12 quintals each. Eventually 1500 carts had to be procured from Germany to complete the transport. Nevertheless, when after the fall of Tssy and Vanves the question arose whether the regular siege of the enceinte could be undertaken. General Hohenlohe declared that it would be possible if a railway were placed at the absolute disposal of the artillery, otherwise the attack would fail for want of ammunition.

The French have adopted for their siege-train equipment the Péchot railway 23'4" gauge, average load for a train 30 tons net; putting the distance between the nearest point of the railway system and the park at 12 miles and allowing 6 hours for each double journey including loading and unloading, or 4 journeys per 24 hours one train could bring up 120 tons a day, and with a double line 4 or 5 trains could be worked simultaneously.

Action.—The attack on the advanced line is virtually a deliberate attack on a strongly intrenched position. Several distinct points of attack should be chosen so as to oblige the defenders to distribute their means of defence and to keep them as long as possible in ignorance of the face or section of the main line it is intended to attack.

The special light siege-train, which can follow the active army at a day's march distance, would be used in this phase in addition to the field artillery with the army, defensive works would be destroyed by indirect and curved fire from light howitzers and mortars, placed in positions as far as possible concealed from the view of the permanent works. Direct fire from light siege and field guns would be used to clear the infantry trenches.

The advanced line taken, the front to be attacked must be decided on, the main sections of the siege-train must now be brought up and placed in position. From the very commencement, certain batteries must be told off for the duty of interrupting the communications along the railways and roads which radiate from or encircle the central nucleus—indirect fire from medium or heavy howitzers or rifled mortars with high explosive shell would be best adapted for this work.

The first important duty of the siege batteries would be to silence the long range guns of the forts in the section of the main line under attack. As these guns will probably be mounted in armoured towers, curved fire from heavy howitzers or mortars with high explosive shell must be used against them. This was demon-

strated at the experiments at Chalons in 1887, when armoured towers with cupolas 9·3" thick, were put out of action by a mortar of 10·5" calibre firing high explosive shell from a distance of 1200 yards, while it was estimated that at the same range it would take from 800 to 1000 rounds from a 5·8" gun with common shell to produce a like effect. The frontal attack of armoured works then should be carried out by curved fire from medium and heavy howitzers placed in concealed batteries at ranges of from 1200 to 1600 yards and firing high explosive shell, and it is only when suitable positions cannot be found within those limits that recourse should be had to direct fire from 5" or 6" guns.

For guns mounted behind armoured shields direct fire from guns of 5" or 6" calibre at ranges not exceeding 1750 yards can be used. At 1750 yards the 5·85" common shell 2·8" calibres long from a 5·85" gun 25 calibres in length will perforate 6·669" of iron if smokeless powder is used and 5·967" with ordinary powder. Heavier guns need only be used against defences of exceptional strength or when the demolition batteries have to be placed at a greater range than 1750 yards.

Curved fire from howitzers of 8·19" or 8·58" will be sufficient for the destruction of magazines and shelters protected by concrete of medium thickness; only when this exceeds 78" need shell with a greater bursting charge than 60 lbs. of melinite, from mortars of 10·34" or 10·92" be used.

Artillery action against the defensive artillery in the intervals.—

The direct fire of the guns of the first and second echelon placed on or slightly behind the crest line of the main line of defence must be silenced by similar fire from guns, curved or indirect fire must however be relied on to silence the fire of the concealed batteries of the 3rd echelon.

If an efficient system of fire observation by captive balloons or other means has been organized this can be effected by comparatively light guns and howitzers at ranges even as great as 4600 yards, and with such a wide margin the besieger should have no difficulty in concealing his batteries from the view of the direct fire guns in the intervals or in the forts, but it is absolutely essential that there should be accurate means of observing and correcting the fire.

Obstacles and the accessory defences of the forts must be destroyed by curved fire, and the terrepleines and trenches searched by curved shrapnel fire—once the forts are rendered untenable and their guns silenced the defences in the intervals deprived of flanking support must soon fall.

The attack on the second line of defence will be carried out in a similar way.

If the fortifications are of a type anterior to those designed to withstand the latest developments of artillery fire, that is to say, if the forts have parapets of considerable length and great relief, if their guns are not protected by armour and their magazines, &c. not proof against high explosive shell; lighter guns and howitzers firing such shell and a less deliberate bombardment will suffice to reduce them. The siege will be much less protracted and the fortifications will have failed to accomplish their main object, viz. that of detaining or demobilizing a portion of the invading army for a considerable time.

Some experiments were recently carried out at Schoorl in Holland to test the penetration of high explosive shell into concrete, and to ascertain the best composition for concrete and the most suitable thickness for bomb-proof roofs, &c.

The ordnance used were—

- (a) Rifled mortar 8·19" 7 calibres long, range 3775 yards, muzzle velocity 633 to 684 f.s., angles of descent between 52° 45' and 60° 40', striking velocities between 594 and 618 f.s.
- (b) 5·85" gun 24 calibres long, range 540 yards, striking velocity 1320 f.s.

Projectiles—

- (a) Steel shell 8·19" 5 calibres long, weight 341 lbs., bursting charge 46·2 lbs., guncotton or 50·6 lbs. bellite,

(b) Steel common shell 5·85", 2·8 calibres long, weight 69·46 lbs., bursting charge 3·85 lbs. powder.

(c) Armour piercing shot 5·85", weight 84·75 lbs.

The objectives were—structures used in fortification such as caponieres, magazines, &c. The walls being built of brick rubble, and brick and cement concrete, the roofs were made of gravel concrete.

The conclusions arrived at were—

(1.) The best composition for concrete was found to be—

1 volume of cement.

1 „ „ sand.

3 „ „ small stones or gravel.

(2.) The necessary thickness for vaulted concrete roofs when the span is under $5\frac{1}{2}$ yards is 4' 10 $\frac{1}{2}$ " and even for greater spans the thickness need not exceed 6' 6".

(3.) The use of panels or plates of iron 39" thick to strengthen the interior of the roofs is recommended, it enables the building to be held even after fissures have appeared through the concrete and does away with any danger from the fall of detached masses.

(4.) The material for the walls in the concrete recommended in (1) or brick and cement concrete the thickness of the walls exposed to fire should be about 46" inches.

(5.) Rubble revetments present a fairly efficient protection against direct fire with common shell.

(6.) The best means of strengthening old type masonry or brick structures is by covering them immediately with a layer of concrete, the interposition of a layer of sand which has been advocated was found to be not only useless but detrimental.

(7.) Wire entanglements were found to be the best kind of obstruction on account of their comparative indestructability even when subjected to fire with high explosive shell.

(8.) For the attack of covering masses of loose earth or sand, sensitive fuzes are to be preferred to delay action, for the explosion of high explosive shell.

A 6·045" shell with a bursting charge of 26·2 lbs. melinite exploded by means of a delay action fuze formed a crater varying from 4' 10 $\frac{1}{2}$ " to 6' 6" in diameter while with sensitive fuzes the crater was 22' 1" across and 6' 9" deep.

PRÉCIS
AND
TRANSLATION.

THE FIELD GUN OF THE FUTURE,

AS PROPOSED BY

GENERAL WILLE AND HIS CRITICS.

TRANSLATED BY

CAPTAIN H. A. BETHELL, R.A.

IN 1891 General Wille of the German Army published a book on "The Future Field Gun." In this he worked out with great thoroughness a complete design, including ballistics, gun, carriages and ammunition, for a field gun far more powerful than any now existing. This work attracted a great deal of attention. Some score of Artillery officers, Engineers, and Gun Constructors published pamphlets and wrote articles criticising the book. Most of the writers proposed rival designs of their own.

In his second book (1892) General Wille replied to those criticisms, eliciting a fresh crop of magazine articles.

In his last book (October 1893) he sums up the results of the discussion.

The whole controversy constitutes a fairly exhaustive *resumé* of modern scientific opinion on the subject, and it is hoped that a brief précis of it will not be without interest.

General Wille (1891) says :—

(1.) The highest quality of a good shooting gun is a deep zone of effect of shrapnel bullets. This is attained by high remaining velocity and small angle of descent, *i.e.* flat trajectory.

(2.) For this we must have high muzzle velocity. This has the collateral advantage of increasing the range—a point however of minor importance.

(3.) To get high remaining velocity and small angle of descent, high muzzle velocity is useless without staying power. A high velocity gun firing a light shell only smashes its carriage to no purpose. To keep up its velocity a shell must have a low $\frac{d^2}{w}$, *i.e.* a high proportion of weight to cross section.

(4.) The weight of a shell for a given calibre is limited by its length, which must not be excessive. General Wille takes the length of his shrapnel at 4.4 calibres including fuze, which gives a projectile weighing 2.39 lbs. per square inch of cross section.

(5.) An analysis of the battles of the last three great European wars leads him to fix the number of shell per gun at 102. Hence a further comparison of existing varieties of field equipment determines the weight of the shell at 14.3 lbs., taking the charge of smokeless cubical powder at 3 lbs.

(6.) It follows from (4) that if the shell is to weigh 14.3 lbs. the calibre must be 2.76 inches.

(7.) Calculation, and comparison of ancient, existing, and experimental gun carriages, give the weight of the gun and carriage as 2094 lbs.

(8.) Calculation and comparison give the best division of this weight as 882 lbs. for the gun and 1212 lbs. for the carriage.

(9.) Calculation, personal experience and the experiments of Grüson and Krupp give $4\frac{1}{2}$ metre tons or 14.77 foot tons¹ as the greatest energy of recoil of the gun that such a carriage, of the best modern construction, will stand.

(10.) This energy corresponds to a muzzle velocity of 2625 f.s.

(11.) Given a gun of fixed calibre to produce a fixed amount of energy, it is clear that the longer the gun the less the powder pressure.

(12.) To bring down his powder pressure² General Wille therefore makes his gun as long as possible. Practical considerations lead him to fix the length of the rifling at 7 feet, and the total length at 9 feet $2\frac{1}{2}$ inches.

(13.) After considering the claims of the interrupted screw and Krupp wedge he selects the Grüson falling block breech-closing arrangement as being the lightest and most efficient. (This system is very like the breech action of a Nordenfeldt Q.F. gun).

(14.) Anticipating some difficulty in obturation at the high pressure proposed, he decides for a metallic self-obturing cartridge with detonating cap complete—in fact, for “fixed ammunition.”

(15.) Having regard to the principle laid down in (1) General Wille decides that all his shell are to be shrapnel with base burster and preferably tungsten bullets,³ except a few high explosive shell. As for case, in the Franco-German war batteries carried 8 per cent. of case and fired 0.12 per cent. only—whence he concludes that case shot are useless. Moreover they are neither so quickly loaded nor so effective as his “fixed ammunition” complete with cartridge, cap and fuze set at zero ready to be loaded into the gun.

(16.) *Fuzes.*—A water fuze perfected by himself. During flight the water (or non-freezing liquid) inside is driven out by centrifugal force. When it is all out the shell explodes. It is only necessary before loading to regulate the amount of water inside by turning the head round.

(17.) The principle of the automatic fuze key consists in setting the key, not the fuze. The key is a socket on the trail or limber with a graduated ring set to the range, and an adjustable zero set to the distance short of burst.

(18.) *Details of Gun Construction.*—General Wille does not fully explain the construction of his gun, but appears to favor a Mannesmann rolled \mathcal{A} tube of nickel steel strengthened by hoops shrunk on. Rifling to be Maitland B.L. with increasing twist, pitch to be decided by experiment.

(19.) *Details of Carriage.*—A Grüson buffer carriage (resembling English

¹ C.f. 12-pr. 5.067 foot tons, new 15-pr. 5.44 foot tons calculated by the same formula

$$E = \frac{(w + \frac{1}{2}w')^2 V^2}{2gW.2240}$$

² In his second book he reckons the maximum pressure at 25 tons on the square inch.

³ His weights and dimensions are calculated on the supposition that the bullets are of lead.

12-pr. but with longer buffer). Trail and axle of Mannesmann tube. A nave brake of circular compressor plates.

He is most particular about his wheels. Height 4 ft. 6 in., weight 165 lbs., tire 2.76 in. steel, 14 spokes of hickory, felloes *Acacia*¹ cut straight and bent flanges stamped from steel plate. Patent boxes, with the Mannesmann device for taking off the wheel quickly. Wagon and limber wheels similar but weighing 143 lbs. only. Can on emergency be used on the gun.

He goes into the question of roller bearings, and dismisses them as useless, as the whole friction at the naves is only (according to German experiments) 1 per cent. of the draught.

(20.) General Wille's theory of carriage construction:—

“Make your experimental carriage so light that when thoroughly tried every part is damaged. Then you know where you are, and can strengthen each part as required. If you make your carriage so strong that when tried no part gives way, you may be sure that many parts are uselessly heavy, but you cannot tell which to lighten.”

(21.) *Limber*.—Tubular steel frame and pole, spring limber hook, one limber box with springs under and falling flap behind, to take the fixed ammunition (30 rounds) horizontally. Limber box wide enough to carry 4 gunners back to back.

(22.) *Wagon body* of tubular steel, springs as on limber. 42 rounds.

(23.) *Spare Carriages*.—Forge wagon abolished and instead a small portable forge carried in one store wagon. Even this might be left behind on a European campaign. 3 store wagons carrying provisions, 3000 lbs. of oats, and small stores and light tools.

(24.) *Sights*.—Open sights, tangent scale fixed in the gun (like our Q.F. guns). Improved clinometer. A complicated apparatus for altering the elevation without laying again. Degrees and minutes for military purposes should be done away with and replaced by a decimal division of the circle.

(25.) *Horse and Field Artillery*.—General Wille will not admit that the Horse Artillery gun may be made lighter at the expense of power. As the Field Artillery weights are the minimum for efficiency, the Horse Artillery gun and carriage can be no lighter. The necessary reduction of weight must be effected by mounting the gunners and reducing the number of rounds to 90 per sub-division.

SUMMARY.

Field Artillery:—

Weight of gun	...	...	...	...	...	...	...	...	882 lbs.
„ carriage marching order	...	...	...	...	...	...	...	...	1212 „
„ limber with 30 rounds, marching order, no	...	...	...	...	...	...	...	...	1874 „
„ gunners	...	...	...	...	...	...	...	...	688 „
„ four gunners on limber at 12 st. 4 lb.	...	...	...	...	...	...	...	...	4656 „
„ gun carriage and limber complete with detach-	...	...	...	...	...	...	...	...	776 „
„ ment in marching order 41 cwt. 64 lbs. or	...	...	...	...	...	...	...	...	3748 „
„ for each horse to pull 7 cwt. nearly or	...	...	...	...	...	...	...	...	860 „
„ wagon with 72 rounds, marching order no	...	...	...	...	...	...	...	...	4608 „
„ gunners	...	...	...	...	...	...	...	...	768 „
„ five gunners 12 st. 4 lbs.	...	...	...	...	...	...	...	...
„ total complete 41 cwt. 16 lbs. or	...	...	...	...	...	...	...	...
„ for each horse to pull 7 cwt. nearly or	...	...	...	...	...	...	...	...

¹ We know it in India as babul, and good stuff it is.

Horse Artillery:—

Weight of gun, carriage and limber as above, no gunners,	
24 rounds only, $34\frac{1}{2}$ cwt.	3858 lbs.
„ for each horse to pull $5\frac{3}{4}$ cwt. or	633 „
„ wagon (no gunners) 66 rounds carried, $33\frac{1}{2}$ cwt.	
or	3732 „
„ for each horse to pull $5\frac{1}{2}$ cwt. or	622 „

Detail of Gun:—

Weight 7 cwt. 98 lbs. or	882 „
Calibre	2.76 in.
Length over all	9 ft. $2\frac{1}{2}$ „
Muzzle velocity	2625 ft.

Rifling—Polygroove, increasing twist.

Breech-closing arrangement—Grüson falling block.

Means of firing—Percussion lock.

Ammunition—Metallic cartridge complete with fuzed shrapnel or high explosive shell.

Charge—About 3 lbs. cubical smokeless powder “C/89.”

Weight of projectile and fuze—14.3 lbs.

Length—4.4 calibres.

Weight of one round complete¹ about 19 lbs.

Weight of projectile per square inch of cross section²—2.39 lbs.

PART II.

In his second book (1892) General Wille enumerates the officers and other critics who have dealt with his book. He then considers their objections seriatim.

(1.) Nine writers find fault with the high powder pressure as compared with the weight of the gun. They variously estimate the maximum pressure at 24 to 30 tons on the square inch, giving the strain on the metal of the gun as 20 to 25 tons per square inch. It is considered that 15 tons per square inch is the maximum safe load. In support of this it is pointed out that according to General Wille's own figures the energy developed amounts to 1740 foot lbs. per pound of gun, while the highest proportion yet attained (by Grüson) is only 960 to 1.

General Wille in reply analyses the calculations of the several critics. He points out that the discrepancies in their results are due (1) to various estimates of the effective length of the bore, after deducting for the powder chamber and breech-block; and (2) to various estimates of the ratio of mean to maximum powder pressure. He accepts in each case the mean of their calculations, and works on the supposition that the rifling is 7 feet long and the mean to the maximum pressure as 2 to 3. After allowing for twist of rifling and resistance of driving band, he gets 25 tons per square inch as the maximum pressure.

He then considers the most advantageous distribution of weight in his gun, and decides on a greatest diameter of 7.875 inches, over a powder chamber of 3.15 inches, giving a thickness of metal of 2.367 inches. Making this in two layers, and supposing the strain on firing to be equally distributed, then, according to the German formula³ the strain on the metal is between $22\frac{1}{2}$ and $25\frac{1}{2}$ tons per square inch.

¹ This leaves 1.7 lbs. for the metallic cartridge. The 6-pr. Q.F. cartridge (the nearest size in our service) weighs 1 lb. 10 oz.

² Q.F. 12-pr. 1.7 lbs., 15-pr. 2.122 lbs., 15-pr. with 1 lb. fuze, or 16-pr. 2.263 lbs.

³ Apparently Barlow without constant,

He then lays down that since the breaking strain of good steel is more than double its elastic limit, therefore if the strain is below that limit this constitutes a sufficient factor of safety. The gun will therefore be strong enough if made of steel with an elastic limit of 27 tons and a breaking strain of 54 tons per square inch.¹

General Wille winds up with a sort of half admission that the foregoing is not quite satisfactory, as an extra high pressure might strain the metal beyond the elastic limit and permanently weaken the gun. He says "If a higher factor of safety be required, we must trust to the discoveries of the future; and then goes on to hint at a card up his sleeve—a novelty either in steel making or gun making—which he is not at liberty to publish.

(2.) Five writers consider the gun carriage too light to stand the recoil.

One points out that it will be strained 2·6 times as severely as the German field carriage. Another critic calculates that a gun of 2095 lbs. and carriage of 1650 would be required to stand the recoil. A third approves of the Gruson carriage but finds fault with General Wille's details, such as the muzzle traversing gear. Others simply condemn the carriage as impossible.

In reply, General Wille compares the various existing field carriages (without buffers) and finds the average strain on them to be 230 foot lbs. per pound of gun and carriage.

Next, he adduces calculation, result of experiment and the admissions of some of his critics to shew that: (a) the hydraulic buffer reduces the strain on the carriage 60 per cent.,² and (b) that nitro powder reduces it a further 15 per cent. Applying these reductions to the strain on his own carriage, he finds it is about the same as on the average field carriage.

He finally states that he has seen a number of rounds fired from a carriage of the same weight as his which had not even a buffer, yet which stood a strain equal to that of the recoil of his gun.

(3.) One writer approves generally of General Wille's design, but considers the length of the gun impracticable. He proposes a 3·15 inch 16½ lb. gun, weighing 926 lbs. and 7½ feet long, to give a muzzle velocity of 1870 f.s. with a powder pressure of 14·7 tons.

General Wille points out that such a gun is so little in advance of present field guns as to be hardly worth making, as it will certainly be obsolete in a year or two.

(4.) The same writer concurs with General Wille as to the value of high velocity in extending the zone of shrapnel effect, but points out as an objection to a flat trajectory the increased difficulty in ranging a battery, as with General Wille's gun. An error in elevation will give double the present error in range.

General Wille replies that this is only a half truth, as the flat trajectory does not require such accurate ranging as the curved trajectory. For instance, with his gun, if you include the target in a 400 yards bracket you can proceed at once to time fuze at the mean of the bracket, since a further correction of 100 yards makes no practical difference in the height of burst of the shrapnel.

He further proves by comparison of 50% rectangles that the length of the rectangle does not increase with the velocity. For instance a Gruson field gun fired at muzzle velocities of 1500 f.s. and 2100 f.s. gave at 1000 yards³ rectangles

¹ See "Treatise on Service Ordnance '93," p. 448, giving tests of "high" steel up to 50 tons on yielding and 71 on breaking.

² Our G.C.F. people do not seem to agree with General Wille or they would have made the 12-pr. buffer carriage 60 per cent. lighter than Mark I. It certainly seems unnecessarily heavy.

³ Metres in the original.

of 17 yards and 21 yards, at 2000 23 and 26, at 3000 37 and 32, and at 4000 58 and 40 yards long respectively.

Several other writers concur with General Wille that a flat trajectory facilitates ranging.

(5.) Follows a long theoretical argument with Captain Moch and other writers as to whether the ballistic co-efficient is a function of the calibre or of the velocity.

Captain Moch compares the French 80 mm gun with the English 12-pr., and points out that the former with nearly the same weight of shell per square inch, keeps up its velocity much better than the English gun.

This, replies General Wille, is because density is a function of velocity, and the density which suffices for the French muzzle velocity of 1525 f.s. is unsuited to the English muzzle velocity of 1720 f.s.

(6.) One writer objects on principle to field guns and goes in for a heavy field howitzer, which can also be fired at low elevations as a gun.

General Wille fights out the old gun *v.* howitzer controversy, and ridicules the idea of vertical fire at a moving target.

(7.) Captain Moch finds fault with the assertion that the proposed gun will stand the premature burst of a high explosive shell—which he considers absurd.

General Wille admits this, and says he only meant he could make his gun tough enough not to burst explosively.

(8.) Various French and Belgian critics condemn Krupp's steel.

General Wille is content to leave Krupp's steel to answer for itself.

(9.) Captain Moch prefers the interrupted screw (which he considers perfect) to the falling block. General Wille refers to an article in the "*Revue Militaire*" enlarging on the defects of the screw, and describing Schneider's new "*obturateur composite*" which is designed to correct them.

(10.) While several critics approve of the proposed Maitland B.L. rifling, others consider that at high velocities this form of groove will shear the driving band sideways.

Should this prove true, says General Wille, the objection is easily got over by the use of shallower grooves and harder metal in the driving band.

(11.) Follows a mathematical argument about the curve of increase of twist.

General Wille prefers a circular to a parabolic curve.

(12.) The critics are far from unanimous about fixed ammunition. Some approve, others object on the score of weight and expense, others prefer a metallic cartridge separate from the shell, and others again think that it will not stand transport in the limbers.

General Wille replies that this question can only be settled by experience. He foresees no more difficulty with field guns than with Q.F. guns in this respect.

He looks to improved manufacture to reduce the weight of his cartridge to 1 lb. Breaking up in the limbers is to be avoided by packing the ammunition horizontally so that it is supported by the body of the shell and the base of the cartridge leaving a clear space round the body of the cartridge.

(13.) Captain K. points out that the application of the small-bore principle to artillery is limited by the rapidly decreasing cubic contents of the shrapnel—since the walls cannot be reduced in thickness without collapsing.

General Wille concurs, but maintains that the limit has not been reached in his gun—especially as his shrapnel are to be of stronger metal, rolled from a solid block in one piece (except the head) by the Mannesmann process.

These shrapnel have already been tried in Austria and found to be enormously strong.

(14.) Captain Moch fully concurs as to the "curve of least resistance" for the head of the shrapnel. This he says, has already been adopted in France. Professor August, however, the inventor of the the curve in question, denies that the French curve is the right one.

(15.) The same writer, Captain Moch, maintains that in a 2.76 inch shrapnel there will be no room for bullets.

General Wille finds fault with his arithmetic, and gives the following distribution of weights :

Bullets (lead)	...	...	...	...	...	...	...	6.018 lbs.
Resin	...	...	...	...	...	...	...	.353 "
Burster 3.52 oz. or	...	...	...	...	...	...	...	.220 "
Fuze	...	...	...	...	...	...	...	1.323 "
Body and head	...	...	...	...	...	...	...	6.415 "
Total								14.329 "

With tungsten bullets the proportion of weight of bullets to weight of steel would be considerably higher.

(16.) Captain Moch objects to tungsten for bullets as too rare and too expensive. General Wille differs, refers to his book on Wolframgeschössi, and promises to confute Captain Moch in his next new book.

(17.) All the critics, with one exception, approve of the proposed abolition of case shot.

(18.) One critic objects to 30 rounds in the limber, as being "too little for a quick-firing gun."

General Wille shews some annoyance at being misunderstood. He repeats emphatically that a quick-firing field gun is an utter impossibility. With admissible limits of weight it is impracticable to construct a field gun absolutely without recoil—so that it need not be laid again after every round—unless indeed the charge is so small as to render the shooting power of the gun contemptible. Even if a Q.F. field gun could be made, it would hardly be worth the trouble, since the "ordinary" rate of artillery fire would on service seldom be exceeded. With regard to the insufficiency of his ammunition supply as compared with modern standards, he considers that the number of rounds carried with the battery is sufficient for any emergency, and that the extra ammunition should be with the column on the road, not tearing across country after the guns. His light carriages with reduced dead weight will much facilitate the supply of ammunition.

(19.) Most of the critics object to the nave compressor brake, as being inefficient, heavy, complicated, jerky in its action, and likely to break the spokes.

General Wille replies : (a) that it is lighter than any tire brake ; (b) that he has seen it thoroughly and successfully tried by Gruson ; (c) that Krupp has just adopted it for his new field howitzer. After which he considers that there is no more to be said.

(20.) Captain K. objects to the tubular steel pole. General Wille replies that this has already been tried and proved a success, and that it has the great advantage of being unbreakable. When ill-treated it bends or doubles up. It never becomes quite unserviceable, and can always be repaired.

(21.) Follows a defence of the Mannesmann tube rolling process against various critics who deny that it has yet reached a practical stage.

(22.) Three critics object that the high velocity and long projectile of the pro-

posed gun will require a twist of rifling so sharp as to give a large angle of opening to the shrapnel, thereby wasting most of the bullets. One of them works out the angle as 20° for medium ranges.

General Wille replies that this calculation is founded on the formula in the English text-book of gunnery. As however this formula gives results differing over 30 per cent. from those practically obtained from the German field gun, he distrusts it and proceeds to work out a formula of his own :

$$\text{Tan: } \frac{\theta}{2} = \frac{\sqrt{h^2 + v^2 \sin^2 \alpha}}{v + s}$$

where θ =angle of opening, h the radial velocity due to the scattering action of burster, v the remaining velocity, α the angle of rifling, and s the forward velocity due to base burster. Hence, taking angle of rifling at 7° or 1 in 26, s and h 140 f.s., v 2110 and 1530 f.s. respectively, $\theta=17\frac{1}{2}$ degrees at 1000 yards and $23\frac{1}{2}$ degrees at 2000 yards. Or putting $s=260$ f.s., $v=2152$ f.s., the angles become 16 and 20 degrees.

Note—These results do not correspond with those obtained by our methods. General Wille, working Siacci, gets 1530 f.s. at 2000 yards. According to the text-book, taking a co-efficient of .9, this should be 1750 f.s. Perhaps the Secretary will ask Professor Greenhill kindly to settle this point for us.

Again, taking the twist (*vide* text-book) at 1 in 28, and the forward velocity due to burster at 100 f.s. only, we get by Nicholson and Hadcock's formula an angle of opening of $11^\circ 14'$ at 2000 yards. This sounds much nearer the truth than General Wille's result.

(*To be continued*).

NOTES

FROM

CORRESPONDING MEMBERS.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below :—

Major-General Stubbs's "List of Officers of the Bengal Artillery," price 5s. 3d.

"Field Artillery Fire," by Captain W. L. White, R.A., price 1s. 2d.

"Notes of Lectures on Artillery in Coast Defence," by Major A. C. Hansard, R.A., price 1s. 2d.

"Ranging Note-Book," by Captain S. W. Lane, R.A., price 1s. 1d.

"Achievements of Field Artillery," by Major E. S. May, R.A., bound, price 2s. 6d.

"The Value of Mobility for Field Artillery," by Major E. S. May, R.A., paper covers, price 3d.

"The Young Officer's 'Don't,' or Hints to Youngsters on Joining," by an Officer R.A., price 7d.

The two Numbers of "Nature" containing Professor C. V. Boys's Lecture on "Photography of Flying Bullets," fully illustrated, price 8d.

Examination questions in (c), (d), and (e) set in the four examinations ending May 1893 :—

Captains (c) and (d) ... price 1s. 1d.

Lieutenants (c) (d) and (e) price 1s. 1d.

Tables of Four-Figure Logarithms, pocket edition, mounted on linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid down for inspection, price for pair (lead and wheel), 1d.

The following note was discovered by Mr. C. Dalton too late for insertion in
5. VOL. XXII.

his article on Capt. Thomas Brown (*see* p. 175, No. 4, Vol. XXII., R.A.I. "Proceedings") :—

The Rev. G. Story's *History of the Wars in Ireland*, 1689-91. Part 2, p. 212.
"Sept., 10, 1691."

[2nd siege of Limerick.]

"And that evening 2 mortars were brought from on board and placed at Mackay's Fort being managed by Lieut. Brown, Lieut. to Capt. Pitt's Miners, who did more execution than all the rest, firing 3 for 1 of theirs and throwing the bombs very exact; he neither made use of sand upon the bomb, nor fired the fuse; but putting it into the mortar with the fuse down, the flash of the powder kindled the fuse as it was discharged from the mortar."

Mem.—Story has this marginal note to above :

"Lieutenant Brown our best bombardier."—

The Rev. George Story was chaplain to the Earl of Drogheda's Regiment in Ireland, in 1691, and at the close of the campaign was made Dean of Limerick.
—C.D.

R.A.I. "DUNCAN" PRIZE ESSAY, 1895.

THE Secretary has received in addition to those mentioned in April "Proceeding," Essays bearing the mottoes :—

"Mens sana in corpore sano."

"'Tis never too late to mend."

"One and all."

"The first duty of a gunner is to hit."

"Nil sine labore."

"Fortiter in re."

"Dum spiro spero."

"Per mare per terras."

"L'union fait la force."

"In medio tutissimus ibis."

"Labor omnia vincit."

GOLF.

THE first inter-regimental Golf matches Royal Artillery *v.* Royal Engineers were contested on Wednesday 24th April 1895 over the links of the St. George's Golf Club Sandwich. The result was decided by the aggregate holes won in the series of single and foursome games and as will be seen from the scores below the Royal Engineers are the first winners. The day was delightful, the course in first-rate order and the matches were followed by a large number of officers of the Regiment. Thanks are due to the Secretary and members of the St. George's Golf Club for their kindness and hospitality, while the officers Royal Artillery Dover did all they could in the way of putting up players and visitors to make the meeting a

success. Everyone present agreed that these matches will soon be among the most popular of inter-regimental fixtures:—

SINGLES (STARTED 10.15 A.M.).

R.A.		R.E.	
Major H. A. Scott	0	Captain H. N. Dumbleton	8
Captain G. D. Chamier	4	Lieutenant R. S. Walker.....	0
Captain A. L. Molesworth	0	Major R. M. Ruck	0
Captain J. L. Smith	1	Major F. W. Bennet	0
Lieut.-Colonel H. H. Crookenden ...	3	Major F. Gosset	0
Captain G. R. Lamb	0	Lieutenant A. H. Dumaresq	7
Major W. H. Darby	0	Lieutenant E. A. Cumming	0
Captain E. G. Nicolls	0	2nd Lieutenant C. St. B. Sladen...	0
	<hr/> 8		<hr/> 15

Captain Dumbleton played 83 and Lieut. Dumaresq 86 strokes in the above matches.

FOURSOMES (STARTED AFTER LUNCH).

R.A.		R.E.	
Major H. A. Scott }	0	Captain H. N. Dumbleton }	2
Captain G. D. Chamier }		Lieutenant R. S. Walker }	
Captain A. L. Molesworth }	0	Major R. M. Ruck }	5
Captain J. L. Smith }		Major F. W. Bennet }	
Lieut.-Col. H. H. Crookenden }	1	Major F. Gosset }	0
Captain G. R. Lamb }		Lieutenant A. H. Dumaresq }	
Major W. H. Darby }	3	Lieutenant E. A. Cumming }	0
Captain E. G. Nicolls }		2nd Lieut. C. St. B. Sladen }	
	<hr/> 4		<hr/> 7

The Royal Engineers won by ten holes on the aggregate.

ALDERSHOT.

ROYAL ARTILLERY RACES.

WEDNESDAY, APRIL 17TH.

Again has this meeting been favoured with fine weather; with big fields, good racing and large attendance it proved an unqualified success. The Gold Cup, after the closest finish known, went to Newcastle while of the other Regimental Races two went to Woolwich and one to Dover; the winners of these four races were steered by the two officers of the Riding Establishment.

The open races brought out one field of eleven, two of six and there was a match between two officers of the Ninth Lancers.

THE ROYAL ARTILLERY WELTER STEEPLECHASE

of 50 sovs., 13 st. 7 lb. each. Two miles and a half.

Capt. R. L. Heygate's MIDSHIPMAN, 5 years.....	Mr. G. GILLSON	1
Capt. H. A. Chapman's SUNFLOWER, aged.....	Capt. J. Hanwell	2
Capt. C. Prescott-Decie's SUNBEAM, aged.....	Mr. E. J. R. Peel	3

Betting: 5 to 4 against Midshipman, 2 to 1 against Sunflower, and 3 to 1 against Sunbeam. The three went along in close order for half a mile, when Sunflower and Sunbeam ran out, and before they were righted Midshipman gained a long lead. This he retained to the end and won easily by fifty lengths; twenty between second and third.

THE ROYAL ARTILLERY GOLD CUP, value 100 sovs., with 50 sovs. to the winner, 20 sovs. to the second, and 10 sovs. to the third; Three miles.

Mr. H. C. Russell-Oldnall's LINCOLN LAD, aged, 12 st. 7 lb.	
	MR. E. J. R. PEEL 1
Capt. R. L. Heygate's NORTHSIDE, 5 years, 13 st.	
	CAPT. J. HANWELL 2
Capt. C. F. Blane's COMRADE, aged, 12 st.....	MR. G. GILLSON 3
Capt. H. M. Ferrar's SURPRISE, aged, 13 st.....	Owner 0
Mr. A. Cowper Smith's TERRIER, aged, 13 st.....	Owner 0
Mr. A. F. Becke's RATEPAYER, aged, 13 st.....	Owner 0
Mr. G. A. Cardew's LEILA, 6 years, 12 st.....	MR. C. O. HEAD 0
Major W. H. Darby's GOSsoon (h-b), 6 years, 12 st	
	Major A. H. Carter 0
Mr. E. P. England's CHOPETTE, aged, 12 st.....	Owner 0

Betting : 6 to 4 against Northside, 4 to 1 each against Lincoln Lad and Comrade, and 10 to 1 against any other. Terrier made play from Chopette, but after going half a mile the first-named was passed by Lincoln Lad and Northside. Reaching the stand Terrier came again, and going to the front he cut out the work with a two lengths lead. At the bend, however, Lincoln Lad and the favourite gave him the go-by, a fine race home between the two ending in favour of Lincoln Lad by a neck. Comrade was a bad third, and Terrier fourth.

THE ROYAL ARTILLERY LIGHT WEIGHT STEEPLE-CHASE of 50 sovs., with 10 sovs. to the second, and 5 sovs. to the third; 11 st. 7 lb. each. Two miles and a half.

Major W. H. Darby's GOSsoon (h-b), 6 years...	MR. E. J. R. PEEL 1
Mr. C. B. Levita's SPIDER, aged	MAJOR A. H. CARTER 2
Capt. H. A. Chapman's KATHLEEN, aged	MR. F. C. LANE 3
Mr. G. H. Sanders's HEReward, aged	MR. G. GILLSON 0
Capt. C. G. Mackenzie's LORD MAYOR, aged	Owner 0
Mr. C. O. Head's KITTY, 6 years	Owner 0
Capt. R. L. Heygate's CINDERELLA, 6 years	CAPT. HANWELL 0
Capt. F. C. Johnston's CLONSHIRE, 5 years.....	Owner 0
Mr. E. B. Ashmore's ROCKSPRING, 6 years.....	Owner 0
Mr. J. B. Aldridge's CANDY, aged.....	Owner 0

Betting : 5 to 2 against Lord Mayor, 4 to 1 against Cinderella, 5 to 1 against Spider, 8 to 1 each against Hereward and Kathleen, and 10 to one against any other. Cinderella led for a good half mile when Gossoon took up the running and never being headed won by three lengths; Kathleen was twice this distance away third, with Hereward fourth, and Candy fifth.

THE ROYAL ARTILLERY CONSOLATION HURDLE RACE of 25 sovs. Two miles.

Captain Blane's COMRADE, aged	MR. G. GILLSON 1
Mr. Mackenzie's LORD MAYOR, aged	Owner 2
Mr. G. A. Cardew's LEILA, 6 years	MR. C. O. HEAD 3
Mr. E. B. Ashmore's ROCKSPRING, 6 years.....	Owner 0
Mr. A. Cowper Smith's TERRIER.....	Owner 0

Betting : 7 to 4 against Lord Mayor, 2 to 1 against Comrade, 3 to 1 against Terrier, 7 to 1 against Leila, and 10 to 1 against Rockspring. Won by fifty lengths; bad third.

REGIMENTAL POINT-TO-POINT RACES.

THE first Regimental Point-to-Point Races were brought off most successfully on Tuesday, 26th March, 1895, over a line in the Essex Hunt country about four miles from Epping. The fields for each race were larger than anyone expected, while the horses were a remarkably good-looking and smartly turned out lot.

The thanks of the Regiment are due to Mr. Tyndale White first for finding the line and secondly for the great assistance given by him to the Stewards. A large number of people from the neighbourhood honoured the Regiment with their company and the attendance of officers Royal Artillery was very good; the Woolwich party had a special train from N. Woolwich, the Colchester and Ipswich party had a coach from Chelmsford and strong contingents *via* London came from Aldershot, Dover, Shorncliffe and Weeton. The only complaint was of the fences which some thought too small and easily galloped over; though there were plenty of ditches they were not as large as those in the Roothing portion of the "Essex" country. The first race, started well to time, resulted in a similar way to the Woolwich Drag Light-Weight Point-to-Point at Kemsing the previous week while the Heavy Weight Race was won by Captain J. W. G. Dawkins on Pilgrim, and is noticeable for the fact that this is the fifth consecutive Point-to-Point Race won by the same rider and horse.

The Farmers' Race was most appropriately won by a horse steered by the Master of the Essex Hunt.

The day was generally fine with one sharp shower about 3.30 p.m.

All who attended thoroughly enjoyed the day and were loud in their praises of the arrangements; it is to be hoped that next year the Stewards may be equally fortunate in their selection of a line and that the Regimental Point-to-Point may become an annual fixture.

Stewards:—L. Arkwright, Esq., (M.F.H.); Tyndale White, Esq. Secretary Essex Hunt; Lt.-Col. R. H. Wallace, R.H.A.; Lt.-Col. G. H. O'Malley, R.A.; Major F. J. Eustace, R.H.A.; Major W. E. Blewitt, R.A.; Captain Wellesley Paget, R.H.A.; Captain J. L. Smith, R.A.; Captain J. B. Askwith, R.A.

Judge:—Lt.-Col. R. H. Wallace, R.H.A. Starter:—Tyndale White, Esq.

Clerk of Scales:—Major W. E. Blewitt, R.A. Secretary:—Captain C. G. Mackenzie, R.A.

RESULTS.—

LIGHT WEIGHT RACE.

Capt. H. M. Ferrar's SURPRISE.....	1
Mr. E. J. R. Peel's GUY FAWKES.....	2
Capt. H. N. Schofield.....	3
Major A. H. Carter.....	4
Mr. J. B. Aldridge.....	5
Capt. Wellesley Paget.....	6

also started, Mr. M. S. Williams, Captain C. G. Mackenzie, Mr. C. J. Morris, Mr. G. H. Sanders, Captain C. E. Goulburn, Captain J. B. Askwith, Captain J. P. DuCane, Mr. A. C. Birch.

HEAVY WEIGHT RACE.

Capt. J. W. Dawkins's PILGRIM.....	1
Mr. A. Becke's RATEPAYER.....	2
Capt. H. G. Ricardo.....	3
Mr. C. Prescott-Decie.....	4
Mr. F. A. Elton.....	5
Capt. C. G. Mackenzie.....	6

also started, Captain H. Ferrar, Mr. A. Cowper-Smith, Mr. G. Gillson, Mr. J. B. Aldridge, Mr. C. Behrens, Captain H. N. Schofield, Major A. H. Carter, Major F. J. Eustace, Mr. G. H. Sanders, Captain A. D'A. King.

OBITUARY.

MAJOR-GENERAL C. T. FRANKLIN, C.B. (retired), died at Tewkesbury, 9th April, 1895. He joined the Royal Artillery as 2nd Lieutenant, 1st January, 1842; became Lieutenant, 14th July, 1842; 2nd Captain, 14th October, 1848; Captain, 20th June, 1854; Brevet-Major, 12th December, 1854; Lieut.-Colonel, 1st May, 1861; Colonel, 30th May, 1867; and retired on full-pay with the hon. rank of Major-General, 9th August, 1873. Major-General Franklin served during the Crimean war, including the battle of Alma, and siege and fall of Sebastopol (medal with two clasps, C.B., 5th class of the Medjidie, and Turkish medal).

COLONEL J. C. D'U. MURRAY (retired), who died at Godalming, on 12th April, 1895, was commissioned as Lieutenant, 1st October, 1857; became 2nd Captain, 20th July, 1871; Captain, 5th July, 1872; Major, 6th February, 1878; Lieut.-Colonel, 6th February, 1885; Colonel, 13th February, 1890; and retired on retired pay, 13th February, 1891. Colonel Murray served in the Afghan war 1878-9.

LIEUTENANT P. T. AYRE, whose death occurred suddenly at Withernsea, Yorkshire, on 17th April, 1895, joined the Regiment as 2nd Lieutenant, 27th July, 1889, and became Lieutenant, 27th July, 1892.

NOTES

FROM

CORRESPONDING MEMBERS.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below :—

- Major-General Stubbs's "List of Officers of the Bengal Artillery," price 5s. 3d.
- "Field Artillery Fire," by Captain W. L. White, R.A., price 1s. 2d.
- "Notes of Lectures on Artillery in Coast Defence," by Major A. C. Hansard, R.A., price 1s. 2d.
- "Ranging Note-Book," by Captain S. W. Lane, R.A., price 1s. 1d.
- "Achievements of Field Artillery," by Major E. S. May, R.A., bound, price 2s. 6d.
- "The Value of Mobility for Field Artillery," by Major E. S. May, R.A., paper covers, price 3d.
- "The Young Officer's 'Don't,' or Hints to Youngsters on Joining," by an Officer R.A., price 7d.
- The two Numbers of "Nature" containing Professor C. V. Boys's Lecture on "Photography of Flying Bullets," fully illustrated, price 8d.
- Examination questions in (c), (d), and (e) set in the four examinations ending May 1893 :—
 - Captains (c) and (d) ... price 1s. 1d.
 - Lieutenants (c) (d) and (e) price 1s. 1d.
- Tables of Four-Figure Logarithms, pocket edition, mounted on linen, price 3d.
- Lithographic plates of Field Artillery Harness stripped and laid down for inspection, price for pair (lead and wheel), 1d.

NOTICE.

THE Committee are having a correctly coloured representation of the Regimental crest, arms and mottoes prepared by the Herald's College. This will be kept at the R.A. Institution and can be sent out on loan to members wishing to consult it.

GAMES' FUND.

THE Committee of the R.A. Games' Fund have subscribed £5 towards the Challenge Cup Fund Inter-regimental Polo Fund (India).

This subscription entitles the Regiment to send a team each year to play in the Tournament, subject to the further charge of 100 rupees to be paid by each competing regiment to provide for the expenses of the year.

The fund is raised to provide a cup to be held from year to year by the regiment winning the Polo Tournament in India.

CORK HARBOUR.

THIS station, in the middle of Cork Harbour, is often said to be unpleasant. It has, however, some advantages. In summer the boating, fishing and river excursions offer much amusement. In winter the weather is usually very mild and healthy. To a married officer living "ashore" the daily run down the hill, the journey by sea, and the pull up hill to Fort Westmoreland, or occasionally Fort Carlisle or Camden, and the return journey later in the afternoon, added to parades and other work, are apt to conduce to a healthy appetite and good digestion. Only a few weeks ago the officer on guard at "Rocky," in rowing with four men to Haulbowline to turn out the guard there, had his boat swamped in a white squall at 12 p.m., and just reached some rocks in time to land before the boat filled.

There is a capital library in the R.A. Regimental Institution on the Island.

"Ashore" the soldier is not without friends in Queenstown. A year ago there was a great appeal made by Miss Sandes for help for the Soldiers' Institutes in Ireland. I do not know the result as a whole, but it is plain to see that Queenstown has not been forgotten. The new Soldiers' Institute, opposite the Admiralty pier, is a bright homelike place, the rooms for reading, games and meetings, are as snug and as comfortable as can be made.

There are many wild waterfowl about the harbour, but they are difficult to get at, and not many are shot by our people. The Inniskillings, however, have a novel method of catching wild fowl, which has proved successful to the only man who has attempted it. "Rocky" Island is known to many; on it is a large powder magazine, and an infantry detachment is posted there with one officer, "The King of Rocky." It is a lonely spot in rough weather. The subaltern only holds his island kingdom for a short period before he is relieved; but to return to the wild fowl: it was a frosty night, and the lone sentry on one side of the rock heard the duck fighting in the deepening twilight. The sentries here always have their bayonets fixed. Suddenly he heard the wings flapping nearer, nearer, till a fine duck actually rose from the water and was just clearing the rock, when the sentry delivered a high point, and the fowl fell at his feet—the bayonet had broken its wing.

A few evenings ago, coming from Spike by the 6.15 launch, just as we had cast off from the pier-head, and were leaving with tide and wind in favour, there was a shout and cry of "man overboard." A bombardier new to the place had jumped for the launch and had gone in; it was very cold and wet and dark. We could not see him and were quickly drifted away. The hands jumped into the small boat and rowed for where the man must be drifting. We heard his shouts but could see nothing. At last all was silence. We steamed back to the pier. It seemed an age for a man to keep afloat on such a cold night with thick boots, clothing and great-coat. On reaching the pier we found the boat had reached the man who had been kept up by his overcoat as by a balloon. He was unconscious, but soon came to and is all right. Had not those in the boat known the drift of the tide very accurately, they must have missed him in the dark.

All here were deeply grieved to hear that Lieutenant Puxley, R.A., had died at sea, a day out from Bombay, on the "Dilwara," of dysentery. He was an excellent golfer, a good sportsman, a good comrade, and a great favourite here.

MANDALAY.

THIS being a single battery station, regimental news is necessarily meagre, but as the place offers some special opportunities for sport and news seldom travels from

such an out of the way locality, I think perhaps a few details may interest brother officers.

Small game shooting is plentiful within a few miles of Mandalay, and lasts for close on eight months in the year, the rain-quail coming in in August and the snipe leaving about March. In the 1893-94 season No. 7 M.B., R.A. game book shows a bag of 9 hares, one pheasant, 10 jungle-fowl, 156½ brace of partridge, 186½ brace of quail, one goose, 170 duck, 1139½ couple of snipe, 34 golden plover, 8 pigeons, 2 curlew and 13 various—total 3213 head. This year to the end of December, the bag consists of 9 hares, 43½ brace of partridge, 153 brace of quail, 12 geese, 105 duck, 694 couple of snipe, 16 plover and 13 various—total 1936 head. The best bag of snipe was 60½ couple by Lieut. Marshall, shot in eight hours—121 birds bagged and four lost for 223 cartridges—very straight shooting and, I believe, a record for Mandalay district. The partridge found here is the Chinese Francolin, a close connection of the black partridge of India, a fearful runner, hard to find without dogs and very eccentric when put up. Big game we have not had much chance at, as it has unfortunately been rather difficult to get away on leave at the right time owing to sections being on command, the drill season, competitive practice coming on and other causes. Major Gunner with Surg.-Captain Bean managed to bag an elephant at Maymyo—a fair tusker—and between us we have shot six *thamin* (brow antlered deer) but none of them with heads of any size. Several of the gunners go in for a little small game shooting, but confine themselves to the larger species, powder being too expensive a commodity out here to waste on quail and snipe.

For two years in succession we have won the Carbine Cup at the Burma Rifle meeting—open to teams of four from any corps armed with the M.H. carbine, 7 shots at two ranges—and are amalgamating the proceeds to procure a Burmese bowl for the mess. Major Gunner has won the Officer's Purse for the second time; in 1893 he also won the Rifle St. Leger—best score at 800 yards, all-comers—and this year wins the Burma R.A. bronze medal for being second for the all-comers championship, being only beaten by one point all up the range. Gunner Johnston won first prize in the Consolation Stakes, and several of the men took minor prizes in different events.

At the Burma district Assault-at-Arms, our drivers won the Natives Lightweight Tug-of-War for the second time, but the gunners met more than their match in the tug for Europeans, the Wilts Regiment producing a well-trained team that averaged 13st. 8lbs., whereas our men could only scale 13st. 2lbs., of course three years in Burma has told on some of our men, and four of our former team were unable to pull from sickness or its after effects; however, I do not think that affected the result, as the Wilts team would be hard to beat anywhere. One of our gunners won "Putting the Shot," and Major Gunner took the cup for Officers' Fencing.

No. 5 (Bo.) M.B. were here with us for about a month in November, having just come back from our only "Sanitarium" Maymyo, where they lost a section of mules from Surra, and on their return had to invalid a large percentage of their men. The authorities, I am told, are prospecting for a new health resort.

SHEERNES.

SINCE last notes there has not been much to chronicle; the Well Marsh has been changed from a cricket ground into golf links, the polo ponies have become hunters, officers have joined and officers have left and Sheerness has been buried in snow, but advantage was taken of it to rig up a sleigh with four ponies driven four-in-hand through the town and round the Isle of Sheppey, with bells clanging

and whip cracking, to the open-mouthed astonishment of the natives. Rackets also have been much in vogue when the court has been playable.

During the last fortnight of January Sheerness was quite gay, Mrs. Wells gave a large dance at Admiralty House on the 24th, which was continued the following evening on a smaller scale, this was followed on the 29th by a dance given by the officers in the R.A. Mess which was pronounced a great success; Mrs. Wace kindly acted as hostess in the absence of Mrs. Uppleby.

Fortnightly smoking concerts are got up for the men in the Recreation Room, and at them several officers assist.

Captain Hall has joined 19 Company, Eastern Division, vice Wray appointed Adjutant of the Honourable Artillery Company.

OBITUARY.

MAJOR-GENERAL F. G. RAVENHILL (retired), whose death occurred on 17th February, 1895, was first commissioned as 2nd Lieutenant, 23rd June, 1852; became Lieutenant, 17th February, 1854; 2nd Captain, 1st April, 1859; Captain, 11th July, 1867; Major, 5th July, 1872; Lieut.-Colonel, 1st October, 1877; Colonel, 1st October, 1881; Major-General, 15th December, 1893, and retired on retired pay, 11th April, 1894. General Ravenhill served in the Crimean campaign and was present at the siege and fall of Sevastopol, and battle of Tchernaya (medal with clasp; Turkish medal). He was Inspector and purchaser of horses from 1st April, 1881, and Inspector-General of Army Remounts from 1st October, 1887, to 31st December, 1893.

MAJOR-GENERAL W. L. YONGE (retired), who died in London on 11th February, 1895, joined the Regiment as 2nd Lieutenant on 19th December, 1850; became Lieutenant, 2nd September, 1852; 2nd Captain, 17th November, 1857; Captain, 18th December, 1864; Major, 5th July, 1872; Lieut.-Colonel, 23rd December, 1875; Colonel, 23rd December, 1880, and retired with the honorary rank of Major-General, 29th October, 1887. He held the appointment of D.-A.-A.-G., Royal Artillery, from 17th July, 1858, to 16th July, 1863. It was through his exertions when D.-A.-A.-G. that the Institution was able to publish the "Cleveland Notes," and the thanks of the Regiment must always be accorded to him for this valuable addition to its history.

MAJOR H. W. B. T. HAVERFIELD (retired), died at Bishops Caundle, on 20th January, 1895. He was commissioned as Lieutenant, 15th January, 1867; became Captain, 30th December, 1878; Major, 20th September, 1884, and retired on retired pay, 19th March, 1890.

DIARY OF FIXTURES.

MARCH.

Day of the					
Mth	Wk.	Regimental.		Cricket, &c.	
1	F	...	...	...	...
2	S	...	...	...	...
3	S	...	...	...	...
4	M	...	...	...	...
5	T	...	...	...	...
6	W	R.A. Band Concert at 3 p.m. Lecture by Major E. S. May, R.A., at 5 p.m., on "The Co-operation of guns with Cavalry."		...	...
7	Th			...	...
8	F	...	...	...	...
9	S	...	...	...	...
10	S	...	...	...	...
11	M	...	...	...	'Ubique' Royal Arch Chapter meets at "Criterion."
12	T	...	...	...
13	W	R.A. Band Concert at 9 p.m. R.A.I. Committee 'At Home' at 4 p.m. Lecture at 5 p.m. by Dr. R. Bowdler Sharpe on "Curiosities of Bird Life."		...	...
14	Th			...	...
15	F	...	...	...	...
16	S	...	...	...	...
17	S	...	...	...	...
18	M	...	...	...	...
19	T	...	...	...	...
20	W	R.A. Band Concert at 3 p.m.		...	...
21	Th			...	...
22	F	R.A. Band Concert at 3 p.m. in London.		...	...
23	S			...	...
24	S	...	...	...	...
25	M	...	...	...	...
26	T	...	...	...	...
27	W	R.A. Band Concert at 3 p.m.		...	...
28	Th			...	...
29	F	...	...	R.A. v. R.E., Rackets and Billiards at Woolwich. R.A. v. R.E., Rackets and Billiards at Woolwich.	
30	S	...	...
31	S	...	...	...	...

APRIL.

1	M	Senior class joins at Woolwich		...	...
2	T			...	...
3	W	R.A. Band Concert at 9 p.m.		...	...
4	Th			...	...
5	F	Long course leaves Woolwich		...	...
6	S			...	...
7	S	...	...	...	...
8	M	...	...	...	...
9	T	...	...	...	...
10	W	...	...	...	...
11	Th	...	...	...	...
12	F	Good Friday.		...	...
13	S			...	...
14	S	Easter Day.		...	...
15	M			...	...
16	T	Bank Holiday. Firemasters' class begins		...	...
			

APRIL.—Continued.

Day of the

Mth	Wk.	Regimental.	Cricket, &c,	Private.
17	W	...	R.A. Regimental Races at Aldershot	...
18	Th	...	...	'Ubique' Mark Lodge of Mark Master Masons meets at "Criterion."
19	F	...	...	...
20	S	...	...	...
21	S	...	...	...
22	M	...	...	...
23	T	...	...	...
24	W	...	...	...
25	Th	...	...	...
26	F	R.A. Band Concert in London	...	...
27	S	...	...	...
28	S	...	...	...
29	M	...	...	...
30	T	...	...	...

MAY.

1	W	1st Division (siege) course at Lydd begins.	R.A. Woolwich v. R.N. College, at Woolwich.	...
2	Th	...	...	...
3	F	...	...	...
4	S	1st Division course begins at Portsmouth and Sandown. 1st Division R.H.A. (Aldershot) joins at Shoeburyness.	R.A. Woolwich v. Shoeburyness at Shoebury.	...
5	S	...	...	...
6	M	Position-finding class begins.	...	...
7	T	...	...	...
8	W	...	...	...
9	Th	...	...	...
10	F	...	...	...
11	S	2nd Division F.A. (Aldershot) joins at Okehampton.	R.A. Woolwich v. N.C. Officers at Woolwich.	...
12	S	...	...	...
13	M	...	...	'Ubique' Lodge meets as "Criterion." Installation of W.M.
14	T	...	...	...
15	W	...	...	...
16	Th	...	...	...
17	F	...	...	...
18	S	3rd Division R.H.A. (Woolwich) joins at Shoeburyness.	R.A. Woolwich v. Blackheath at Blackheath.	...
19	S	...	...	...
20	M	...	R.A. v. Greenjackets, at Woolwich.	...
21	T	...	R.A. v. Greenjackets, at Woolwich.	...
22	W	...	...	...
23	Th	...	...	...
24	F	...	R.A. v. Aldershot Division at Aldershot.	...
25	S	1st Division R.H.A. begins at Glenbeigh. 2nd Division course begins at Portsmouth and Sandown. 4th Division F.A. (Woolwich) joins at Shoeburyness.	R.A. v. Aldershot Division at Aldershot.	...
26	S	...	...	...
27	M	...	...	...
28	T	...	Epsom Meeting begins.	...
29	W	...	Derby.	...
30	Th	...	...	...
31	F	...	Oaks.	...

JUNE.

Day of the

Mth	Wk.	Regimental.	Cricket, &c.	Private.
1	S	5th Division F.A. (Ipswich) joins at Shoeburyness.	... ..	... ..
2	S	Whit Sunday.	... ..	... ..
3	M	Bank Holiday.	R.A. Woolwich v. R.M.A., at R.M.A.	... ..
4	T	...	... ..	... ..
5	W	2nd Division F.A. (Hilsea) joins at Okehampton.	... ..	... ..
6	Th	...	... ..	... ..
7	F	Annual General Meeting of R.A.I. at R.U.S.I. at 3 p.m. 2nd Division F.A. at Glenbeigh begins.	REGIMENTAL DINNER.	
8	S	6th Division F.A. (Weedon) joins at Shoeburyness.	... ..	... ..
9	S	...	... ..	... ..
10	M	...	... ..	'Ubique' Royal Arch Chapter meets at "Criterion," Installation of Principals.
11	T	...	... ..	... ..
12	W	...	... ..	... ..
13	Th	...	R.A. v. Quidnuncs at Woolwich.	... ..
14	F	...	R.A. v. Quidnuncs at Woolwich.	... ..
15	S	3rd Division course begins at Portsmouth and Sandown.	R.A. Woolwich v. Shoeburyness, at Woolwich.	... ..
16	S	...	... ..	... ..
17	M	...	R.A. v. Eton Ramblers, at Woolwich.	... ..
18	T	...	R.A. v. Eton Ramblers, at Woolwich. Ascot begins.	... ..
19	W	...	... ..	... ..
20	Th	...	... ..	... ..
21	F	3rd Division F.A. at Glenbeigh begins.	R.A. v. R.E., at Woolwich.	... ..
22	S	...	R.A. v. R.E., at Woolwich.	... ..
23	S	...	... ..	... ..
24	M	...	... ..	... ..
25	T	...	... ..	... ..
26	W	...	R.A. v. Yorkshire Gentlemen, at Woolwich.	... ..
27	Th	...	R.A. v. Yorkshire Gentlemen, at Woolwich.	... ..
28	F	2nd Division (Siege) course at Lydd begins.	R.A. v. Household Brigade, at Burton's Court, Chelsea.	... ..
29	S	...	R.A. v. Household Brigade, at Chelsea.	... ..
30	S	...	... ..	... ..



NOTES

FROM

CORRESPONDING MEMBERS.

ROYAL ARTILLERY STEEPLECHASES.

IN consequence of the great difficulty experienced, under the present system, in collecting the Annual Subscriptions to the above, it was decided at the last General Meeting to invite all officers to sign a standing authority to their bankers to pay their subscriptions to the race fund annually on 1st January.

The amount of the subscription is optional, but badges of admission will only be issued to subscribers of £1 and upwards.

Officers wishing to become subscribers are requested to notify their wish to Mr. E. H. Garland, Messrs. Cox and Co., 16, Charing Cross, S.W.

No officer will in future be qualified to enter or ride horses at the Meeting who is not a subscriber of at least £1 to the race fund.

A copy of the last statement of accounts is published, also a list of subscribers for 1894.

The 1895 Meeting will take place at Aldershot (probably on 17th April), and the conditions of the four regimental races will be the same as last year, viz :—

The Royal Artillery Gold Cup value 100 sovs., with 50 sovs. to the winner, 20 sovs. to the second, and 10 sovs. to the third ; for horses, the property of, and to be ridden by, Officers on full or half-pay of the Royal Artillery, that have never won a steeplechase value 90 sovs., and have been regularly hunted during the past season by their nominators or by some other Officer qualified to enter ; 12 st. each ; the winner of a steeplechase under 50 sovs. in value to carry 7 lb. extra, of two or more such races, or of one or more steeplechases value 50 sovs. to carry 14 lb. extra ; no penalties for winners of regimental races ; entrance 2 sovs., but starters free except the winner ; three miles.

The Welter Steeplechase of 50 sovs., with 10 sovs. to the second, and 5 sovs. to the third ; for horses (not thoroughbred), the property of, and to be ridden by, Officers on full or half-pay of the Royal Artillery, or Officers who have retired from the Regiment, which have been regularly hunted during the past season by their nominators, or by some other Officer qualified to enter, and have never won a race of any description ; 13 st. 7 lb. each ; entrance 1 sov., but starters free except the winner ; two miles and a half.

The Light Weight Steeplechase of 50 sovs., with 10 sovs. to the second, and 5 sovs. to the third ; for horses (not thoroughbred), the property of, and to be ridden by, Officers on full or half-pay of the Royal Artillery, which have been regularly hunted during the past season by their nominators, or by some other Officer qualified to enter, and have never won a race of any description ; 11 st. 7 lb. each ; entrance 1 sov., but starters free except the winner ; two miles and a half.

A Consolation Hurdle Race of 25 sov., for beaten horses in the regimental races ; the second to receive 4 sovs. out of the race ; 12 st. each ; post entrance 1 sov. ; two miles, over eight flights of hurdles.

Full programmes will be issued in due course, giving date of Meeting, date of closing, and the conditions of the open races.

R.A. BEAGLES, WEYMOUTH.

If you want a vent for the proverbial superfluous energy of the Gunner Subaltern—aye, and for the matter of that of older ones too—I cannot imagine a more suitable pastime than the sport of hunting with beagles.

“What about fox-hunting?” you say. Yes, that’s true, but we do not all keep horses.

Now for beagles all that is wanted is a good pair of legs and bellows, and these requisites I flatter myself the Royal Artillery possess as well as most people.

It was at the end of last season we started our pack, a modest $2\frac{1}{2}$ couple, which has now risen to $6\frac{1}{2}$ couple. But don’t imagine that even last season we had no sport. Though in the nature of things we only had a few meets, we had some fine runs, and the cheery “Ya-allo-ee find her Brevity” of Talbot-Ponsonby, our then Master (alas, now absent on leave), echoed often over the downs, till the tune was changed to “gone away for’ard, for’ard.” Then what a scattering! Ponsonby well to the fore, sticking to it through the Lodmore Marshes, now up to the waist in water, then back again up a formidable hill, over a heavy plough, stone wall, thorn hedge, another plough sticky and deep, another hill. I mark the music of the horn as the checks is getting more uncertain; no wonder, after an hour or so of such work. And the rest of the field by no means make a poor show. Close supporters of Ponsonby are the whips—Anley, Lewis, Scott, Broughton (transferred now, to our regret, to another command), Corbyn and Westerman, both now also among the much missed.

Tailing off are some dozen keen ones, while in the distance seeking, more or less leisurely, points of vantage for a view, are some 20 or 30 visitors, including many ladies. Puss of course circles, as all do; and so these latter see a good deal of the fun.

We do not kill on this occasion; but who will say, as taking a well-earned rest on Balaclava heights, we scan our homeward road some 250 feet below us, that he does not feel better for the outing and has not enjoyed himself, or that our little pack, with their delightful music and skilful working, has not given us the rarest of sport. Talk about “*Odora canum vis*”—Virgil ought to have been there to see it, and if he had brought Diana with him, she would have fainted with rapture.

Then, in the summer, we are up at all hours of the morning exercising our pets before the day’s work begins—and frequent visits to the kennels and talks over the merits of Duchesses, Rubies, and Carelesses help to while away our leisure hours.

If the subject interest any members of the Institution, I shall be glad, as far as I am able, to give in a future paper some account of our (this season’s) doings. And should the perusal of this short note induce Gunners at other stations to start packs of beagles, it will not be written in vain.

OBITUARY.

CAPTAIN C. E. MATURIN (retired) died in London on 7th December, 1894. He joined the Regiment as Lieutenant, 19th August, 1875; became Captain, 14th August, 1884; and retired on retired pay, 10th August, 1892.

NOTES

FROM

CORRESPONDING MEMBERS.

GOLD MEDAL PRIZE ESSAY, 1895.

THE Subject approved by H.R.H. The Commander-in-Chief for the "Duncan" Gold Medal Prize Essay, 1895, is as follows:—

"The most suitable system applicable for training together in peace time the Garrison Artillery forces of the Empire, including Regular, Militia, Volunteer, and Colonial Artillery, with a view to their duties in war time in Coast Fortresses being more clearly defined."

The Rules for the Prize Essays now read:—

The Annual Gold Medal, when awarded, to be accompanied by an *honorarium* of £20; the Silver Medal by an *honorarium* of £10.

The candidates must be Officers of the Regiment who are members of the R.A. Institution.

Officers are requested to confine their Essays to about 16 printed pages of the "Proceedings;" other things being equal brevity will count towards success.

The Essays must be forwarded to the Secretary so as to reach him on or before the 1st of April.

Each Essay must be *type-written* in triplicate. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written outside and the name of the writer inside; further, if the writer wishes to recover from the Committee part of the cost of type-writing his Essay he should state this fact in the same sealed envelope and write outside it, above the motto, "to be opened."

All the envelopes thus marked will be opened by the Secretary after the result of the competition has been announced, and he will send the writers the money for their type-writing expenses.

The Committee will allow a sum of £1 for type-writing each Essay.

N.B.—The Committee draw particular attention to the paragraph in the Rules above on the subject of length of Essays; it is not difficult to discover the number of words in an average page of "Proceedings" matter, and so to keep an Essay within the 16 pages' limit.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below:—

Major-General Stubbs's "List of Officers of the Bengal Artillery,"
price 5s. 3d.

"Field Artillery Fire," by Captain W. L. White, R.A., price
1s. 2d.

"Notes of Lectures on Artillery in Coast Defence," by Major A.
C. Hansard, R.A., price 1s. 2d.

"Ranging Note-Book," by Captain S. W. Lane, R.A., price 1s. 1d.

"Achievements of Field Artillery," by Major E. S. May, R.A.,
bound, price 2s. 6d.

"The Value of Mobility for Field Artillery," by Major E. S. May,
R.A., paper covers, price 3d.

"The Young Officer's 'Don't,' or Hints to Youngsters on Joining,"
by an Officer R.A., price 7d.

The two Numbers of "Nature" containing Professor C. V. Boys's Lecture on "Photography of Flying Bullets," fully illustrated, price 8d.

Examination questions in (c), (d), and (e) set in the four examinations ending May 1893 :—

Captains (c) and (d) ... price 1s. 1d.

Lieutenants (c) (d) and (e) price 1s. 1d.

Tables of Four-Figure Logarithms, pocket edition, mounted on linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid down for inspection, price for pair (lead and wheel), 1d.

It has been suggested by a member that if an officer R.A. in each station, and others scattered about over the world, could at their leisure copy any memorial brasses or tombstone inscriptions (in the various churches and chapels which they may come across) which refer to deceased Royal Artillery officers, a valuable help would be afforded to the regimental records generally, besides bringing to light very probably many interesting genealogical, military, and regimental facts which would be of much interest. Officers might send their MS. copies to the Secretary of the Institution, who would keep them all together and in time get them chronologically arranged and tabulated. Measures could be taken at some future date to utilise them in the manner which would appear most interesting to the Regiment. In many cases these regimental memorials might be photographed and so avoid copying. It is not to be expected that anything like a complete list is likely to be obtained for long, if ever, but there can be no doubt that much might be done in this way without any great amount of trouble. To avoid the same thing being done twice or oftener, a record of its having been done up to a certain date might be kept at the head-quarter station, and from time to time lists of those deceased officers whose memorials had been copied could be published in the "Proceedings." This is merely a rough idea, and the Secretary would be glad of any suggestions with regard to it.

BOOKS RECOMMENDED FOR THE STAFF COLLEGE AND PROMOTION EXAMINATIONS

BY

LIEUT.-COLONEL EDEN BAKER, R.A.

[Always follow closely the Syllabus in the Queen's Regulations.]

MILITARY LAW.

LIEUTENANTS.—Army Annual Act, 1894.

Manual of Military Law, 1894.—Army Act. Parts I., II., and V. (Sections 175 to 184 and 190). Rules of Procedure. Reserve Forces Act, 1882 and 1890.

Queen's Regulations, 1894. Sections VI., XIX. and XXII.
Military Law, by Lieut.-Col. S. C. Pratt. 9th Edition, 1895.

CAPTAINS, IN ADDITION TO THE ABOVE :—

Manual of Military Law, 1894.—Army Act. Parts III., IV., and V. (Sections 185 to 189), and Schedules. Militia Act, 1882.

FIELD FORTIFICATION.

Instruction in Military Engineering. Part I., Field Defences 1892 (*omit fougasses and large inundations.*)

Manual of Elementary Field Engineering (*omit Sections 12 to 15, 18, 20.*)

Defence and Attack of Positions, by Colonel Schaw. 3rd Edition. *Read* Chapters 5, 7, 8 and 9.

MILITARY ADMINISTRATION.—*Staff College only.*

The Army Book for the British Empire.

MILITARY TOPOGRAPHY.

Text-book of Military Topography, 1888 (*omit pages 110 to 158, and 181 to 227.*)

TACTICS.

Infantry Drill, 1893. *Read* the tactical part on pages xxiv, xxvi, 11, 50 51, 87, 90, 94 to 192, 244 to 249.

Short Notes on Tactics and Reconnaissance, 1887, by Major Jocelyn, R.A. *Read* pages 7 to 62, but note that Infantry formations have been altered by Infantry Drill 1893 and Artillery Intervals and Distances by Field Artillery Drill, 1893.

Minor Tactics by Colonel Clery. 12th Edition. *Omit* examples except for the Staff College Examination.

Preliminary Tactics, by Major Eden Baker. 1892. *Read* Ammunition Supply (the Battery Supply System has been altered), Time and Space (note that the following pages have been altered:—last line page 45, nearly all page 46, top half of page 48, and on page 49 lines 6 to 16 and 29 and 30), and Marches. *Read* also pages 82 to 91, and 140 to 152.

Field Artillery, by Lieut.-Col. S. C. Pratt. The tactical portion.

ARTILLERY.—*Lieutenants R.A. for Promotion Examination.*

Text-book of Gunnery, 1887. Chapters I., II., XII., XIV., and XVII. (A new Edition is in the Press).

Treatise on Service Ordnance, 1893.

Treatise on Military Carriages, 1888. (A new Edition is in the Press).

Treatise on Ammunition, 1892.

Regulations for Magazines, &c., 1894.

Manual of Field Range-finding, 1890.

Hand-book for the Depression Range-finder, 1893. } *Alternative.*

Field Artillery Drill, 1893. For Horse and Field Batteries only.

Garrison Artillery Drill, 1891–92. } *For Garrison Artillery only.*

Siege Artillery Drill, 1891.

Handbook for Field Service, Vol. I., Field Artillery. *Omit* Parts I.; IV.; VII., 1 and 3; VIII., 2 and 3; IX., 2 and 3; X.; XI., 2, 7 and 10. (Now being re-written).

Preliminary Tactics, by Major Eden Baker, 1892. *Read* pages 171 to 174, 178, 179, and Chapters V. and IX.

ARTILLERY.—*Volunteer Officers (Captains and Lieutenants).*

Official Handbooks of Guns on which examined.

Field Artillery Drill, 1893.

Garrison Artillery Drill, 1891.

Handbook of Artillery *Matériel*, by Lieut.-Col. Morgan.

STAFF COLLEGE ENTRANCE EXAMINATION, 1895.
MILITARY HISTORY AND GEOGRAPHY.

Vide "Regulations respecting the Staff College," issued with Army Orders, 1st May, 1894.—Also Army Order 132, September, 1894.

Officers going up for the Staff College Examination are recommended to read all Magazine Articles, Lectures, &c., that refer to Field Subjects.

ARTILLERY COLLEGE, WOOLWICH,
January, 1895.

ROYAL ARTILLERY DINNER CLUB.

The following Rules have been agreed to by a majority of the Members of the Club, and approved by H.R.H. the Colonel of the Regiment. They came into force from 1st January, 1891.

RULES.

Officers of the Royal Artillery, on full or half-pay, can become Annual Subscribers at the rate of five shillings per annum, under the following conditions:—

- (a) On joining the Regiment.
- (b) If a Subaltern, by payment of five shillings for every year of service up to five years, which shall be the maximum number of years subscription chargeable to officers of that rank on joining.
- (c) If a Captain, by payment of six years subscriptions, *i.e.* £1 10s.
- (d) If a Major, by payment of seven years subscriptions, *i.e.* £1 15s.
- (e) If a Lieut.-Colonel, by payment of eight years subscriptions, *i.e.* £2.

THE

ROYAL ARTILLERY ANNUAL DINNER

WILL TAKE PLACE AT

QUARTER BEFORE EIGHT O'CLOCK,

On FRIDAY, 7th JUNE, 1895,

AT

THE HOTEL MÉTROPOLE

(Private Entrance in Whitehall Place),

HIS ROYAL HIGHNESS THE COLONEL OF THE REGIMENT
IN THE CHAIR.

Prices as follows:—

					£	s.	d.
Subscribers	...	...	...	...	0	16	0
Non-Subscribers	...	...	...	...	1	15	0

Dinner Tickets will not be supplied, but officers are requested to give their visiting cards at the entrance, on the evening of the dinner, to the official appointed to receive them.

It is particularly requested that officers intending to dine will furnish *early*

intimation to the Honorary Secretary; and, to avoid inconvenience, it is desirable that the same should be accompanied by *cheque*, for the amount of subscription to the dinner, *except from officers who bank with Messrs. Cox & Co.*, who are informed that the amount due from them for the dinner will be charged to their accounts.

Names of officers who notify their intention of being present at the dinner cannot be removed from the list after the 4th June, and officers who omit to notify before that date will be charged an extra sum of 5s.

Should an officer wishing to dine have been unable to give notice before 4th June, he should inform the Secretary at the War Office direct, and not apply to the Hotel officials,

Advertisements will duly appear in the *Times*, *Morning Post*, and *Army and Navy Gazette*.

All communications to be addressed to

MAJOR F. G. STONE,

Hon. Secretary R.A. Dinner Club,

HORSE GUARDS,

WAR OFFICE, PALL MALL.

NOTICE.

It is proposed that the first Inter-Regimental Golf match, R.A. v. R.E., shall be contested in April, 1895, by eight players on each side, probably at Sandwich.

Any officer desirous of representing the Royal Artillery should send his name to the Hon. Secretary, R.A. Games' Fund, Woolwich, together with a statement showing the club where he generally plays and his handicap in it, and an account of any match play in which he has taken part.

R.A. BAND.

THE R.A. Band Committee desire to submit to officers of the Regiment, particularly those serving abroad, that it would be for the convenience of all concerned if officers would arrange to authorize Messrs. Cox and Co. to credit their band subscriptions as they fall due by a standing authority.

Owing, in many cases, to similarity of names and difficulty in deciphering signatures, remittances by money order or cheque frequently causes difficulty, not only to the band accountant but it is thought to the officers themselves.

R.A. BAND Concerts in London are fixed for 22nd March and 26th April.

WOOLWICH.

MANY readers of the "Proceedings" may like to know how the "Old Drag" is getting along. The annual dinner to the landowners and farmers was held on 27th October and was exceedingly well attended. Major-General Smart very kindly took the chair, and in a speech thoroughly to the point proposed the health of the guests, which was responded to by Sir John Pender. The hunt has as usual met with encouragement from the occupiers of land, and there is every hope of a good season. The wet state of the land has been rather a hindrance to

the usual number of runs before Christmas, and a few days have been lost from frost, but with the disappearance of the latter good runs may be looked for. The fields have been large as regards numbers. There is no doubt that there has been a great increase in wire lately; but several of our good friends remove enough of it to let the hounds and field pass with safety over their lands.

Lieut.-Colonel F. A. Yorke is Master, and Captain Birch, A.-D.-C. and Lieut. Cowper-Smith are Whips.

OBITUARY.

MAJOR-GENERAL J. H. P. ANDERSON, Retired List, Royal Artillery, died at Wimbledon, on the 7th January 1895, aged 58. He entered the service 28th February, 1855, and retired 7th September, 1886, with the honorary rank of Major-General. He served in the Crimean campaign, 1855, including the siege and fall of Sebastopol (medal with clasp, and Turkish medal); and in the China War, 1857-60, including the capture of Canton, 1857, actions of Sinho, Tangku, capture of the Taku Forts, actions near Tangchow and surrender of Pekin (medal with clasp).

LIEUT.-COLONEL J. B. SWETE (retired), whose death occurred on 20th January, 1895, was commissioned as a Second Lieutenant into the Madras Artillery on 10th December, 1847, and retired as honorary Lieut.-Colonel 1st August, 1872. Lieut.-Colonel Swete served in the Indian mutiny, and was severely wounded at the affair at Chichumba (medal).

MAJOR A. L. PRINGLE (retired), who died at Richmond on 21st January, 1895, joined the Regiment as Lieutenant 12th January, 1866; became Captain 14th April, 1878, and retired with honorary rank of Major, 9th July, 1885. He served in the Hazara campaign of 1868 (medal).

LIEUTENANT R. B. L. PUXLEY died at sea, on 23rd December, 1894. He joined the Regiment as Second Lieutenant, 27th July, 1889, and became Lieutenant, 27th July, 1892.

NOTES

FROM

CORRESPONDING MEMBERS.

“DUNCAN” GOLD MEDAL PRIZE ESSAY, 1896.

THE Subject approved by H.R.H. The Commander-in-Chief for the “Duncan” Gold Medal Prize Essay, 1896, is as follows :—

“Ammunition Columns and Parks, considered with reference to the replacement of ammunition, horses and men during and after an action.”

The Rules for the Prize Essays now read :—

The Annual Gold Medal, when awarded, to be accompanied by an *honorarium* of £20; the Silver Medal by an *honorarium* of £10.

The candidates must be Officers of the Regiment who are members of the R.A. Institution.

Officers are requested to confine their Essays to about 16 printed pages of the “Proceedings;” other things being equal brevity will count towards success.

The Essays must be forwarded to the Secretary so as to reach him on or before the 1st of April.

Each Essay must be *type-written* in triplicate. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written outside and the name of the writer inside; further, if the writer wishes to recover from the Committee part of the cost of type-writing his Essay he should state this fact in the same sealed envelope and write outside it, above the motto, “to be opened.”

All the envelopes thus marked will be opened by the Secretary after the result of the competition has been announced, and he will send the writers the money for their type-writing expenses.

The Committee will allow a sum of £1 for type-writing each Essay.

The Essays will be submitted for decision to three Judges chosen by the Committee.

The Judges are empowered to recommend :—

1. That two Medals, one Gold and one Silver, be awarded, or
2. That only one Medal, Gold or Silver, according to the merit of the Essay, be awarded, or
3. That no Medal be awarded.

The names of the successful candidates will be announced at the Annual Meeting, and Medallists will be distinguished as such in all Lists, &c., issued from the Institution; and in the event of a University man gaining a Medal, a report of his success will be made to the University of which he may be a member.

The successful Essays will be printed and circulated to members by the Institution.

N.B.—The Committee draw particular attention to the paragraph in the Rules above on the subject of length of Essays; it is not difficult to discover the number of words in an average page of “Proceedings” matter, and so to keep an Essay within the 16 pages’ limit.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below:—

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Translated by Colonel N. L. Walford, price 5s.

Major-General Stubbs’s “List of Officers of the Bengal Artillery,”
price 5s. 3d.

“Field Artillery Fire,” by Captain W. L. White, R.A., price
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trated, price 8d.

Examination questions in (c), (d), and (e) set in the four examina-
tions ending May 1893:—

Captains (c) and (d) ... price 1s. 1d.

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linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid
down for inspection, price for pair (lead and wheel), 1d.

DINNER TO H.R.H. THE DUKE OF CAMBRIDGE, K.G.

THE Dinner given by the Officers of the Royal Artillery to H.R.H. the Duke of Cambridge, on his relinquishing the Command of the Army, was the finest entertainment in the Royal Artillery Mess, Woolwich, for many years past.

Officers of the Regiment attended from 23 different stations; enthusiasm ran high and regrets were sincere.

The occasion and the varied attendance of Officers are both worthy of record, so for that purpose the accompanying diagram of the seats in the mess-room is published.

The ranks of the Officers present were as follows:—

Generals ...	...	...	...	...	...	...	...	9
Colonels ...	...	...	...	...	...	...	...	38
Majors ...	...	...	...	...	...	...	...	23
Captains ...	...	...	...	...	...	...	...	49
Lieutenants ...	...	...	...	...	...	...	...	47
Riding-Masters	...	...	...	...	...	...	...	6
Quarter-Masters	...	...	...	...	...	...	...	5
District Officers	...	...	...	...	...	...	...	5

ENTRANCE FOYER.

Major Abdy	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	Shipman	"	Wilken	44	46	Capt. Clark
Capt. Gterson	83	88	82	84	56	35	36	37	53	38	39	40	50	41	49	42	"	Dawkins	"	M. C. Munseell	44	46	Lieut. Hankey
Major Coker	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	Devenish	"	Phipps	44	46	Senior Under Officer of Cadets W. Stirling
Major Chapman	83	88	82	84	56	35	36	37	53	38	39	40	50	41	49	42	"	Metcalfe	"	"	44	46	"
Capt. Phipps-Hornby	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	Best	"	"	44	46	"
Capt. Schofield	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	Livingstone-Learmouth	"	"	44	46	"
Lt.-Col. Yorke	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Peel	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Blandy	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Rainsford-Hannay	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Elmslie	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Major Hunter	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Major Lambart	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Col. Wace	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Stone	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Uppleby	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Major Stone	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Dalton	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Josselyn	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Chapman	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Balfour	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Darley	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Capt. Cookson	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Lt.-Col. Downing	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Major W. E. Blewit	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"
Capt. Churchill	68	63	67	34	56	35	36	37	53	38	39	40	50	41	49	42	"	"	"	"	44	46	"

Col. Dittmas	15	16	Lt.-Col. Browell	129	Capt. Carleton	130	Capt. Hon. B. Tyrwhitt
" Pearson	14	17	Col. Thomson	128	" Cleve	131	" Heffernan
" Olivant	13	18	" Gregory	127	" Hon. A. Lambart	132	Lieut. Perkins
" Lockhart	12	19	" Watkin	126	" Merriman	133	" Van-Straubensee
" Maurice	11	20	" Bainbridge	125	Major Donnelly	134	Capt. Chamberlin
" Burgmann	10	21	" Trench	124	Capt. McKenna	135	Major Murdoch
Gen. Lloyd	9	22	Gen. Geary	123	" Dawson	136	Capt. McLennan
Lord Roberts	8	23	" Forster	122	" Martel	137	" F. H. Crampton
H. R. H.		24	" Smart	121	" Adair	138	" Von Donop
Gen. Chapman	6	25	" A. Williams	120	" Minchin	139	" R. P. Benson
" Markham	5	26	" Nicolls	119	Lieut. Lambarde	140	" Fasson
Col. Turner	4	27	Col. Tollner	118	" Coningham	141	" Currie
" Langley	3	28	" A. C. FitzGeorge	117	Capt. Denne	142	" Berkley
" Wallace	2	29	" F. Slade	116	" Crawford	143	" Kiner
Lt.-Col. Bingham	1	31	" R. McG. Stewart				

Major Slater	101	102	Capt. Heygate	129	Capt. Carleton	130	Capt. Hon. B. Tyrwhitt
Capt. Handley	100	103	" Ferrar	128	" Cleve	131	" Heffernan
" J. T. Johnston	99	104	Major J. Newton	127	" Hon. A. Lambart	132	Lieut. Perkins
" E. M. Perceval	98	105	" Curteis	126	" Merriman	133	" Van-Straubensee
" Bunbury	97	106	" Baldock	125	Major Donnelly	134	Capt. Chamberlin
" Tinker	96	107	Lieut. Parsons	124	Capt. McKenna	135	Major Murdoch
" Tisdall	95	108	Major Penton	123	" Dawson	136	Capt. McLennan
" G. Benson	94	109	" Barlow	122	" Martel	137	" F. H. Crampton
" Ducret	93	110	Capt. J. L. Smith	121	" Adair	138	" Von Donop
Lieut. Vallentin	92	111	" Jenkinson	120	" Minchin	139	" R. P. Benson
" Stanton	91	112	" Blunt	119	Lieut. Lambarde	140	" Fasson
" Head	90	113	" C. D. King	118	" Coningham	141	" Currie
" Aldridge	89	114	Major Brady	117	Capt. Denne	142	" Berkley
" Hooper	88	115	" Boileau	116	" Crawford	143	" Kiner

Major Slater	101	102	Capt. Heygate	129	Capt. Carleton	130	Capt. Hon. B. Tyrwhitt
Capt. Handley	100	103	" Ferrar	128	" Cleve	131	" Heffernan
" J. T. Johnston	99	104	Major J. Newton	127	" Hon. A. Lambart	132	Lieut. Perkins
" E. M. Perceval	98	105	" Curteis	126	" Merriman	133	" Van-Straubensee
" Bunbury	97	106	" Baldock	125	Major Donnelly	134	Capt. Chamberlin
" Tinker	96	107	Lieut. Parsons	124	Capt. McKenna	135	Major Murdoch
" Tisdall	95	108	Major Penton	123	" Dawson	136	Capt. McLennan
" G. Benson	94	109	" Barlow	122	" Martel	137	" F. H. Crampton
" Ducret	93	110	Capt. J. L. Smith	121	" Adair	138	" Von Donop
Lieut. Vallentin	92	111	" Jenkinson	120	" Minchin	139	" R. P. Benson
" Stanton	91	112	" Blunt	119	Lieut. Lambarde	140	" Fasson
" Head	90	113	" C. D. King	118	" Coningham	141	" Currie
" Aldridge	89	114	Major Brady	117	Capt. Denne	142	" Berkley
" Hooper	88	115	" Boileau	116	" Crawford	143	" Kiner

Lt.-Col. Chapman	87	60	Lt.-Col. Peel	61	Lt.-Col. Blandy	62	Major Hall	63	Lt.-Col. Rainsford-Hannay	64	Major Hunter	65	Major Elmslie	66	Capt. Churchill	73
" Josselyn	86	61	" Dalton	85	" Dalton	86	" Josselyn	87	Major Lambart	79	Col. Wace	78	Lt.-Col. Stone	77	Capt. Cookson	76
" Darley	75	72	" Darley	76	" Darley	75	" Darley	76	Lt.-Col. Downing	71	" Darley	72	" Darley	73	Major W. E. Blewit	74
" Fasson	140	119	Lieut. Lambarde	118	" Coningham	141	" Currie	142	Berkley	143	" Crawford	144	" Kiner	145	" Berkley	146
" Von Donop	138	121	" Adair	137	" Martel	136	" Dawson	135	Capt. Chamberlin	134	" Merriman	133	" Van-Straubensee	132	" Hon. A. Lambart	131
" Heffernan	131	128	" Cleve	129	Capt. Carleton	130	Capt. Hon. B. Tyrwhitt									

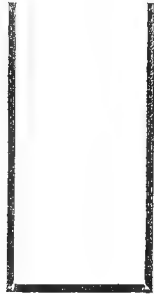
WALL.



PILLAR.



WALL.



PILLAR.



Lt.-Col. Chapman	87	60	Lt.-Col. Peel	61	Lt.-Col. Blandy	62	Major Hall	63	Lt.-Col. Rainsford-Hannay	64	Major Hunter	65	Major Elmslie	66	Capt. Churchill	73
" Josselyn	86	61	" Dalton	85	" Dalton	86	" Josselyn	87	Major Lambart	79	Col. Wace	78	Lt.-Col. Stone	77	Capt. Cookson	76
" Darley	75	72	" Darley	76	" Darley	75	" Darley	76	Lt.-Col. Downing	71	" Darley	72	" Darley	73	Major W. E. Blewit	74
" Fasson	140	119	Lieut. Lambarde	118	" Coningham	141	" Currie	142	Berkley	143	" Crawford	144	" Kiner	145	" Berkley	146
" Von Donop	138	121	" Adair	137	" Martel	136	" Dawson	135	Capt. Chamberlin	134	" Merriman	133	" Van-Straubensee	132	" Hon. A. Lambart	131
" Heffernan	131	128	" Cleve	129	Capt. Carleton	130	Capt. Hon. B. Tyrwhitt									

Lieut. Edwards	196	170	Lieut. Wilson	171	" Jacob	172	" McCombie	173	" Learmont	174	" Schofield	191	174	190	176	189	176	188	177	187	178	186	179	185	180	184	181	183	182
" Davies...	194	171	" Jacob	172	" McCombie	173	" Learmont	174	" Schofield	191	174	190	176	189	176	188	177	187	178	186	179	185	180	184	181	183	182	Major Richey	...
" Wade	193	172	" McCombie	173	" Learmont	174	" Schofield	191	174	190	176	189	176	188	177	187	178	186	179	185	180	184	181	183	182	Capt. Price	...	Capt. Firth	...
" Hay	192	173	" Learmont	174	" Schofield	191	174	190	176	189	176	188	177	187	178	186	179	185	180	184	181	183	182	Major Richey	...	Capt. Firth	...	Capt. Richey	...

R.A. LIBRARY, WOOLWICH.

THIS Library, probably one of the best military reference libraries in the kingdom, has recently been catalogued by Mr. Francis Edwards, 83, High Street, Marylebone, at a cost of nearly £200.

The catalogues are divided into 3 sections—

- (1) Military.
- (2) General Literature.
- (3) Fiction.

and a limited number of these are on sale at the comparatively small prices of 9d., 9d. and 6d. respectively.

Every Artillery Mess should possess copies and probably every officer in the Regiment who takes any interest in literature or books will provide himself with these catalogues. Study of them will show what a magnificent collection the Library is and how information on any subject connected with the military arts can be obtained from it.

A comparison with the catalogue of the R.A. Institution Library will show that there is little fear of the two clashing as the most valuable additions to the latter are greatly in the form of the newest and best foreign military books, the purchase of which scarcely comes within the scope of the R.A. Library.

HONG KONG, CHINA.

THE R.A. Polo Pony Club has now been running for three months and is a flourishing concern and is well supported, the only difficulty being one that affects all players in the Colony, the inferiority of ponies.

The Regiment though making a good show at the monthly gymkhana failed to win as many events as during the previous month.

Several gunners are away on leave in Japan and Mongolia but are returning at the commencement of the cool weather, when we hope to have the four R.A. yachts in commission.

One of the men here—Sergeant W. H. Smith of 35 Co. S.D.R.A.—received a silver Hong Kong medal in the recent distribution for his services in the epidemic last year.

MADRAS.

AN Association Football Tournament open to all batteries stationed in the Madras Presidency has just been inaugurated. A handsome Challenge Cup, to be competed for annually, has been purchased from subscriptions given by the Colonel on the Staff and the batteries in the Presidency. This year the final ties were played off at Bangalore and the cup won by the 29th Field Battery team from Belgaum, beating "S" R.H.A. in the final, four goals to one. Twelve batteries entered teams this year.

OBITUARY.

COLONEL C. E. NEWPORT (retired), Royal (Bombay) Artillery, who died on 6th November at Bonnyrigg, Midlothian, was first commissioned as 2nd Lieutenant, 9th December, 1854; became Lieutenant, 27th August, 1858; Captain, 1st July, 1863; Major, 5th July, 1872; Lieut.-Colonel, 31st December, 1878; Colonel, 31st December, 1882; and retired, 19th April, 1888. Colonel Newport served in the Persian Expedition, 1856-7 and was present at the surrender of Bushire, and battle of Kooshab. Medal with clasp. Indian Mutiny, 1858. Pursuit of Tantia Topee.

THE death is announced at Cheltenham of Major-General G. B. Shakespear (retired). He was first commissioned as 2nd Lieutenant, 13th December, 1836; became 1st Lieutenant, 11th September, 1839; 2nd Captain, 9th November, 1846; Captain, 30th August, 1852; Lieutenant-Colonel, 22nd December, 1857; Colonel, 22nd December, 1862, and retired with the rank of Major-General, 10th March, 1875.

NOTES

FROM

CORRESPONDING MEMBERS.

“DUNCAN” GOLD MEDAL PRIZE ESSAY, 1896.

THE Subject approved by H.R.H. The Commander-in-Chief for the “Duncan” Gold Medal Prize Essay, 1896, is as follows:—

“Ammunition Columns and Parks, considered with reference to the replacement of ammunition, horses and men during and after an action.”

The Rules for the Prize Essays now read:—

The Annual Gold Medal, when awarded, to be accompanied by an *honorarium* of £20; the Silver Medal by an *honorarium* of £10.

The candidates must be Officers of the Regiment who are members of the R.A. Institution.

Officers are requested to confine their Essays to about 16 printed pages of the “Proceedings;” other things being equal brevity will count towards success.

The Essays must be forwarded to the Secretary so as to reach him on or before the 1st of April.

Each Essay must be *type-written* in triplicate. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written outside and the name of the writer inside; further, if the writer wishes to recover from the Committee part of the cost of type-writing his Essay he should state this fact in the same sealed envelope and write outside it, above the motto, “to be opened.”

All the envelopes thus marked will be opened by the Secretary after the result of the competition has been announced, and he will send the writers the money for their type-writing expenses.

The Committee will allow a sum of £1 for type-writing each Essay.

The Essays will be submitted for decision to three Judges chosen by the Committee.

The Judges are empowered to recommend:—

1. That two Medals, one Gold and one Silver, be awarded, or
2. That only one Medal, Gold or Silver, according to the merit of the Essay, be awarded, or
3. That no Medal be awarded.

The names of the successful candidates will be announced at the Annual Meeting, and Medallists will be distinguished as such in all Lists, &c., issued from the Institution; and in the event of a University man gaining a Medal, a report of his success will be made to the University of which he may be a member.

The successful Essays will be printed and circulated to members by the Institution.

N.B.—The Committee draw particular attention to the paragraph in the Rules above on the subject of length of Essays; it is not difficult to discover the number of words in an average page of “Proceedings” matter, and so to keep an Essay within the 16 pages’ limit.

On the Employment of Artillery in Cuba.

WITH reference to the remark in paragraph 2, page 547, of the current number of "Proceedings," "What nature of Artillery the Spanish Government is employing in the field." Lieut.-Colonel J. C. Dalton, R.A., writes: "Since the above was printed I have ascertained that the force of Artillery at present in Cuba consists of 8 fortress companies and 24 mountain guns of the Plasencia system, but up to now their services have not been called into requisition, possibly because the war has as yet not assumed great proportions."

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below:—

"Twenty-four hours of Moltke's Strategy" by Fritz Hoenig.
Translated by Colonel N. L. Walford, price 5s.

Major-General Stubbs's "List of Officers of the Bengal Artillery,"
price 5s. 3d.

"Field Artillery Fire," by Captain W. L. White, R.A., price
1s. 2d.

"Notes of Lectures on Artillery in Coast Defence," by Major A.
C. Hansard, R.A., price 1s. 2d.

"Ranging Note-Book," by Captain S. W. Lane, R.A., price 1s. 1d.

"Achievements of Field Artillery," by Major E. S. May, R.A.,
bound, price 2s. 6d.

"The Value of Mobility for Field Artillery," by Major E. S. May,
R.A., paper covers, price 3d.

"The Young Officer's 'Don't,' or Hints to Youngsters on Joining,"
by an Officer R.A., price 7d.

The two Numbers of "Nature" containing Professor C. V. Boys's
Lecture on "Photography of Flying Bullets," fully illus-
trated, price 8d.

Examination questions in (c), (d), and (e) set in the four examina-
tions ending May 1893:—

Captains (c) and (d) ... price 1s. 1d.

Lieutenants (c) (d) and (e) price 1s. 1d.

Tables of Four-Figure Logarithms, pocket edition, mounted on
linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid
down for inspection, price for pair (lead and wheel), 1d.

WEEDON.

The "Centenary Cup."

ON Wednesday, 9th October, the Deputy-Adjutant-General, R.A. went to Weedon to present the Centenary Cup to the 52nd Field Battery; this battery having won the 1st prize competitive practice at Okehampton, 1895.

The Cup (presented by Major-General F. T. Lloyd, C.B., D.-A.-G., R.A.) is to be competed for annually; this year by the Horse and Field Artillery at Okehampton, next year by the Garrison Artillery. As this is the first year of its

existence special interest attached to the occasion. The D.-A.-G. addressed the battery as follows :

“Major LLOYD, Officers, N.-C. Officers and men of the 52nd Field Battery, it was with much pleasure that I accepted Major LLOYD's invitation to come down here to-day to present this cup. In instituting it there were two motives ; one being to do honour to the memory of a great and gallant soldier of the Royal Artillery, whose centenary as first Deputy-Adjutant-General of the Royal Artillery we celebrate this year, and who above all others was instrumental in raising our regiment to a position of greater importance and efficiency than it had ever occupied before. A short history of Lieut-General Sir John Macleod is contained in a parchment scroll in the plinth of the cup. The other motive was to mark every sense of the importance of excellence in shooting. To secure such excellence as you had attained you have need of officers who knew their work and did it and N.-C.O.'s and men yielding a cheerful and ready obedience. Further than this you must all from your training have acquired a knowledge of the necessity for that co-operation which is the very essence of successful warfare from the largest to the smallest operation, and you must have been taught to realize the importance of correctness in details, the omission of which is fatal to success. Some may say that you were lucky in winning this cup, I cannot think so, for your history for the past three years shows that every year you attained a high figure of merit, and long continued excellence must sooner or later take the first place—just as in cricket a first-class bat may go out for a duck's egg, but at the end of the season his average will be a high one. Your average has been high and this year you have again come out with the top score.

You will, I am sure, agree with me that you owe much of your success to the energy and ability of your Commanding Officer, and in a less degree to the Officers and N.-C.O.'s of the battery who have so well supported him.

The history of this battery is remarkable and distinguished—raised in 1817 as the Indian “Rocket” Troop it became in 1818 the 7th Troop of Bengal Horse Artillery and remained a Horse Artillery Battery in the East India Company's Service and in the Royal Artillery till 1887, when it was converted into a Field Battery as T/2nd Brigade and afterwards as 52nd Field Battery. The war services of the Battery are numerous and important and include the following campaigns and battles, *viz.* :

Siege of Hattrass, 1817.

1st Burmese War, 1824.

Siege of Bhurtpore, 1825-6.

Afghanistan—Siege of Ghuznee, occupation of Cabul, 1839.

Gwalior Campaign—Battle of Maharagpore, 1843.

Sutley Campaign—Battles of Aliwal and Sobraon, 1846.

Punjab Campaign—Battle of Chillianwallah, 1849.

” ” ” Goojerat, 1849.

Indian Mutiny, 1857-8.

N.W. Frontier, 1863.

Such a record must inspire a strong feeling of pride in you all, and I cannot doubt that if in the future this battery is called on for active service in the field it will not be unmindful of the glorious services in which it took part in past years.

I have the greatest pleasure in congratulating Major LLOYD and the whole battery on their success in being the first to win the Centenary Cup.”

Major LLOYD having briefly thanked the D.-A.-G. on behalf of the battery, the proceedings terminated.

BOMBAY.

THE following extracts from the General Report of the practice in the R.A. Poona Circle for the season of 1894-95, though reproduced somewhat late in the year are full of interest; their publication has been delayed in the hope of receiving similar reports from Bengal and Madras :—

An experiment for concentration behind covers with continuation bar suggested by Captain S. W. Lane, R.A.

An experiment was tried to utilize more artillery fire when in action behind cover, and also to enable guns to withdraw from a position when the enemy has been re-inforced, or the batteries troubled by advancing skirmishers during the artillery duel.

It was found that with the addition of a wooden movable continuation bar for each gun, put on the ordinary deflection leaf, for the occasion, that the fire can be concentrated very successfully from behind cover with ease and accuracy.

The manner in which these experiments were carried out, was as follows :—

BRIGADE DIVISION.

Range and concentrate under cover.

All batteries place pickets lined on to the object, so that distribution can commence at first round.

Batteries then come up and take up their positions independently and come into action, elevation being given by clinometer or Scott's Sight.

Centre battery finds the range (the Commanding Officer placing himself to a flank and keeping up communication with his battery); this is communicated to the flank batteries, who verify with 3 rounds each to get a bracket.

Centre battery also gets fuze and communicates this to batteries (Captain up with centre battery to carry on), then all take up slow fire 25' intervals, and on order to concentrate, the number of minutes or division of deflection on continuation bar will be ordered; but flank batteries must, on concentration, increase their range themselves over range found by 50 yards at medium ranges. . . .

A Brigade Division being overwhelmed by a re-enforced enemy, or attacked by skirmishers when in action.

Three Batteries come into action on ridge and each finds its own range on opposing guns, each gun placing out 2 pickets in rear for line. The centre battery retires and gets into action, laying forward on pickets and using clinometer elevation; it commences firing directly the flank batteries come into action with it, and each battery verifies with four rounds. The Commanding Officer of the centre battery will be on the flank and keep up communication with Battery (Captain to come up and carry on), then gives elevation and fuze to flank batteries who get the order as to number of Divisions on continuation bar required to concentrate on centre batteries. Then all take up slow fire.

Flank Batteries must remember to give 50 yards more elevation on concentration being ordered.

90 per cent. of the shell fell in the Battery concentrated on. As few rounds as possible were used to carry them out as ammunition was scarce.

The cost of addition of the wooden movable bar to the present tangent scale is very small, and all that is required is simply to put the bar on or take it off the tangent scale when required.

The Reconnaissance class consisted of two selected men from each of the five batteries, and the following rules were drawn up :—

1. The scouts are not to proceed in any direction more than one mile from the Batteries in open and half a mile in enclosed country (except under special instructions), and they must never lose touch of the Batteries.

2. Their duties are generally to keep their eyes open and note anything relating to the enemy on the disposition of his troops, especially with regard to woods, villages, hills or rivers. But their chief duty is to ascertain how the Batteries can best advance in the direction indicated, what ground must be passed over, whether cultivated or not, and what are the best positions for the guns to occupy in action for the accomplishment of the purpose of which the Commander has instructed them (the scouts).
3. They are to make a sketch of the ground, marking the N point, which should show all the details above described and they must write any notes descriptive of these details in their pocket-books.
4. Directly they have finished their task they are to hasten back to the Commander and deliver the report.
5. It is not intended that the scouts shall undertake the whole duty of reconnaissance, which can only be properly performed by Cavalry; but it is believed that while accomplishing their special duty, they will be able without delaying that duty to collect much valuable information.

SERVICE PRACTICE SERIES IX (a) AND X (a).

Service
Practice.

On the last day of service practice batteries were set a task intended to show their real fire strength. Two targets, an infantry one at about 1,300 yards, and a gun target at about 2,000 yards, were placed on a range new to all the Batteries. They were to fire, in succession, for 4' on the infantry, then turn on to the guns and fire for 6' thus firing for 10' in all, including ranging twice, no range-takers allowed. From the results it may be seen that, supposing the 5 batteries had been in line, each with its own targets, the percentage of the Infantry Target destroyed per minute was 23.1 and that of the Gun Target, 12.98 (or 92.4 and 77.88 of the entire targets).

OBITUARY.

COLONEL C. E. STIRLING (retired), who died at Lucerne on the 7th October, 1895, joined the Regiment as 2nd Lieutenant, 18th June, 1851; became 1st Lieutenant, 3rd October, 1853; 2nd Captain, 5th June, 1858; Captain, 8th August, 1866; Major, 5th July, 1872; Lieut.-Colonel, 1st May, 1880; and retired on retired pay with the hon. rank of Colonel, 1st July, 1881. Colonel Stirling served in the Crimean Campaign from April 1855, and was present at the siege and fall of Sebastapol (medal and clasp, and Turkish medal).

LIEUT.-COLONEL W. RIDDELL (retired), whose death occurred at Edinburgh on 15th October, 1895, was first commissioned as Lieutenant, 15th January, 1867; became Captain, 31st December, 1878; Major, 7th November, 1884; Lieut.-Colonel (on half-pay), 7th November, 1891, and retired on retired pay, 27th June, 1894. Lieut.-Colonel Riddell served in the Afghan war of 1878, and was present at the attack and capture of the Peiwar Kotal (medal with clasp).

CAPTAIN A. G. NAPIER died at Zurich on 20th October, 1895. He joined the Regiment as Lieutenant, 27th July, 1880; became Captain, 10th May, 1889, and was placed on half-pay owing to ill-health, 2nd September, 1894. Captain Napier served in the Soudan Expedition 1884-5 (medal with clasp and bronze star).

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BIRMINGHAM.

Communications regarding Advertisements must be sent to Mr. Thomas MacVeagh,
15, Montague Place, London, W.C.

NOTES

FROM

CORRESPONDING MEMBERS.

POLO.

THE R.A. team this year made a better fight for the Regimental Cup than they have ever done before. Unfortunately they drew against the 13th Hussars in the first round, but with any luck in the draw ought to have been in the final.

The sides were as follows :—

R.A.	v.	13TH HUSSARS.
1 Captain Tisdall.		Mr. Pedder.
2 Mr. Peel.		„ Wise.
3 „ Aldridge.		„ Church.
Back Captain Hanwell.		Captain MacLaren.

The 13th Hussars won the toss, and elected to play with the wind, thereby gaining a decided advantage.

The regiment lost the first goal, but with the wind equalised matters before the end of the first ten minutes, thanks chiefly to Mr. Peel.

At the end of the second turn the score was two all.

In the third ten minutes, owing to the want of ponies, the R.A. came rather to grief, the Hussars scoring two goals to love.

After this however the R.A. were at their best, and fairly out played their adversaries, hitting two goals, one a splendid shot of Captain Hanwell's of about 100 yards, thus making the score four all.

Nothing was scored in the fifth turn, and so the last ten minutes was started with game still four all.

Towards the end the R.A. ponies again rather failed, and the Hussars once more had the best of the game, and so scored for the fifth time. Just as the bell was about to ring they added one more, and so won by six to four.

The regiment however were far from disgraced, as no other team could equal their performance, the 13th eventually winning the cup for the third time.

Captain Hanwell was in his best form, scarcely making a mistake from start to finish, and it is chiefly due to his coaching that the others have learnt their places and played so well together. Captain Tisdall had the somewhat hopeless task of keeping Captain MacLaren out of the game, but he managed to do so as well as any other No. 1. Mr. Peel as 2, played brilliantly, making some of the best runs of the whole Tournament, while Mr. Aldridge, considering it is his first year in first-class matches, may be fairly proud of his performance.

THE ROYAL ARTILLERY (WOOLWICH) POLO TOURNAMENT.

TEN teams entered, but at the last moment the 9th Lancers, R.A., Aldershot, Essex Club, Stansted Club, and a Hurlingham team had to scratch, which only left a team from the Household Cavalry, the Scots Greys, Fetcham Club, R.H.A., Woolwich, and Field Artillery, Woolwich. The first ties took place on Monday, July 22, as follows:—

FIELD ARTILLERY.	v.	HOUSEHOLD CAVALRY.
Major Manifold.		Mr. Rose.
Captain Schofield		Captain Milner.
„ Ferrar.		„ FitzGerald.
Major Porteous.		Mr. Schreiber.

The R.A. began well, but were eventually defeated by five goals to two. The ground was in perfect condition, and play was fast from start to finish.

The second match was between—

THE GREYS.	v.	FETCHAM CLUB.
Mr. Conolly.		Mr. Drake.
„ Harrison.		„ G. Sheppard.
Major Hippisley.		„ Fort.
Mr. Pringle.		„ Trollope.

Fetcham scored the first goal, but the Greys soon equalised matters. The game continued in a most equal manner, and as the last quarter began the score was two all. The Greys, however, then played better together, and won by three—two.

On Tuesday, the 23rd, the R.H.A., who had drawn a bye, played the Household Cavalry. The sides were:—

R.H.A.	v.	HOUSEHOLD CAVALRY.
Mr. Butler.		Mr. Rose.
„ Peel.		Captain Milner.
„ Gillson.		„ FitzGerald.
„ Aldridge.		Mr. Schreiber.

This proved to be quite a first-class game, and well worth seeing. The R.H.A. team were, with the exception of Mr. Butler playing for Captain Hanwell, the same team that won the Rothschild prize in the Paris Tournament last month. The visitors were a good deal better mounted than the home team, and eventually won, in spite of some brilliant play by Mr. Peel, by three goals to two.

After this match the R.A. played the Fetcham team, who were defeated on the previous day. On this occasion, however, the R.A. had Captain Hanwell to play for them, and won rather easily by five goals to two.

The final took place on Thursday, the 25th, between the Scots Greys and the Household Cavalry. Owing to an accident to Major Hippisley, Mr. Barnes, of the 4th Hussars, kindly came at the last moment and took his place. The ground was still playing beautifully, and the game was fast, the ball going the whole length of the ground in three or four hits. The Greys won the toss, and played down wind, which gave them some advantage. The first four goals were made with the wind, making the score at half time two all. Then the Household scored against the wind, and changing ends, made the score four—two. The Greys, however, added one more to their score, and looked like equalising matters, but this was not to be, for the Household team, playing well together in the last turn, won by five goals to three.

The tournament proved a great success, thanks chiefly to Captain Hanwell, Captain Blane, and Mr. Gillson, and will be repeated next year, when, with longer notice, more teams ought to be able to compete. The R.A. entertained the visiting teams throughout the week, and stabled all the ponies.

ALDERSHOT.

ROYAL ARTILLERY Polo at Aldershot has been waking up lately, thanks partly to the arrival of the Brigade Division from Woolwich. I never can understand why polo, so enthusiastically supported there, languishes amongst us of the regiment at Aldershot. We have an excellent ground, placed in a central position, open five days a week, from 1st May until 30th September, so that during those five months, even in race weeks, you are certain of a game. Added to this, the ground on every side of the field is eminently adapted for training the young idea, human and equine.

The first match we were able to have was against the 4th Hussars' subalterns.

R.A.	v.	4TH HUSSARS.
1 Mr. Pim.		1 Mr. Churchill.
2 „ Head.		2 „ Savory.
3 „ Cowper-Smith.		3 „ Graham.
4 Captain Mackenzie.		4 „ Barnes.

The R.A. scored almost at once, but towards the close of the first ten minutes Mr. Pim's pony falling heavily, completely laid his rider out. It looked a very nasty fall, and though no bones were broken, it will probably be some time before the gallant No. 1 will be fit to play again. Both he and his ponies have been greatly missed. Mr. Byron was looking on in flannels, but ready for all emergencies, he took the place of our unfortunate No. 1.

Naturally we felt the change, as a strange man on strange ponies, however good individually, generally upsets a side. The Hussars scored three goals in the next ten minutes, and the game stood at three to one against us. During the next twenty we held them well, getting two more goals to their one. The game remained at this, four goals to three, until the last half-minute, when one of our forwards scored, leaving us four goals all. It was too late to play it off.

Our next match was against the 9th Lancers' second team.

R.A.	v.	9TH LANCERS.
Mr. Byron.		Mr. Campbell.
„ Head.		„ Henry.
„ Cowper-Smith.		„ Beale-Browne.
Captain Mackenzie.		Captain Wykeham-Fiennes.

It is always a pleasure to play against a combination of the Ninth, as, whoever the individual player may be, they always play polo. This day, as our opponents chivalrously allowed, we had the best of the game most of the time, though at the call of time the score stood four to three in their favour. This of course means better shooting on their part than ours, which means better polo. They did not get through very often, but scored each time they did, whilst we were constantly shooting at their goal and missing it. However, it was a good and cheery game.

Our next was against a Divisional team.

R.A.	v.	ALDERSHOT.
Mr. Byron.		Mr. Campbell, 9th Lancers.
„ Head.		„ Lawson, Scots Greys.
Captain Mackenzie.		Captain Hickman, Worcester Regt.
Mr. Cowper-Smith.		„ Maxwell, Scots Greys.

We were now to feel the advantage of having a team which had played together a few times against one which had not, and we won somewhat easily by eight goals to three.

Our next antagonists were the 4th Hussars, a stronger and better mounted team. Though they beat us easily by four goals to nil, it was not a bad game, and

was a fairly fast one. One of our back's ponies gave out after the first ten minutes, and he practically played the rest of the game on one good grey pony.

The sides were—

R.A.	v.	4TH HUSSARS.
Mr. Byron.		Mr. Churchill.
„ Head.		Major Peters.
Captain Mackenzie.		Captain Hoare.
Mr. Cowper-Smith.		Mr. Barnes.

We had now come to the end of our ponies, and had to turn to Woolwich for assistance. The head-quarters responded nobly, sending Ferrar and Aldridge, to enable us to take on a strong team of the 9th Lancers.

R.A.	v.	9TH LANCERS.
1 Mr. Head.		1 Mr. Campbell.
2 Captain Ferrar.		2 Major Little.
3 „ Mackenzie.		3 Captain Wykeham-Fiennes.
Mr. Aldridge.		„ Hon. C. Willoughby.

The ground was in very bad order, caused by the heavy rain and much play. We started somewhat brilliantly, Mr. Aldridge hitting two goals in the first ten minutes. In the second the Ninth equalised matters, and soon after made a third goal. The R.A. now played their hardest, and if a “sitter” had not been missed in front of goal, would have made the score even again. The fourth goal was obtained by the Ninth out of a scrimmage, and the score, at the beginning of the last twenty minutes, stood at four to two. A somewhat lucky goal was soon after hit by Captain Mackenzie, and we did our level best to make it a tie. Just before time, however, a fatal backhander in front of goal placed the ball for Willoughby, who swooped down upon it and scored, leaving us defeated, after a well contested game, by five goals to three.

We owe a debt of gratitude to Mr. Hobson, a good and keen player of the game, who has lately joined the Horse Artillery from India. He enabled us to play most of these matches by unselfishly (and quite unasked) placing his one made pony at the disposal of Byron, whose stud has been reduced by an accident to one pony. Captain A. King has also assisted us considerably by valuable advice, and by umpiring for us.

I have written this long yarn in the hope that officers of the Regiment coming to Aldershot may believe that it *is* worth while keeping ponies there.

OBITUARY.

SECOND LIEUTENANT A. A. FALCON, died at Malta on 2nd August, 1895. He was commissioned on 3rd January, 1894.

LIEUTENANT A. S. MILLER, who died at Cherat, E.I., on 9th August, 1895, from disease contracted during the Chitral Expedition, joined the Regiment as Second Lieutenant, 16th February, 1890, and became Lieutenant, 16th February, 1893.

SECOND LIEUTENANT C. A. L. P. BUSHE, who died at Charlton on 11th August, 1895, was commissioned as Second Lieutenant, 15th February, 1889.

NOTES

FROM

CORRESPONDING MEMBERS.

Owing to the length of "Proceedings" matter all Notes, Cricket and Diary are omitted this month.

R.A. GAMES' FUND.

THE Annual Meeting was held at the R.U.S.I. on Friday, 7th June, when the following Report and Accounts were presented: the accounts are for the year 1894 and show an increase in the credit of £50.

The number and value of grants to various stations exceed those made in any one year since 1883.

The results of the current year's Racket and Billiard matches were most satisfactory as the Regiment succeeded in winning back both cups.

As the silver plates on the plinths of the cups were full of names the committee of the R.E. Fund suggested that each Fund should pay for another step to the plinth of one cup this step to be provided with enough silver plates for recording the names of winners for sixteen years. This has been ingeniously carried out by Messrs Elkington without necessitating the enlargement of the cases in which the cups travel.

The Inter-regimental Golf Match, the institution of which was approved by the last Annual meeting, was played for the first time over the St. George's Club, Sandwich, Links, on 22nd April and resulted in a victory for the R.E. by 10 holes in the aggregate. The meeting was attended by several officers of the Regiment, principally from Dover, who agreed that it will soon become a most popular annual fixture. No cup has yet been provided as the Committee of the R.E. Games' Fund on going into the matter could not see their way to meeting the R.A. Committee.

A subscription of £5 has been paid from the Fund on behalf of the Regiment to the Indian Inter-regimental Polo Challenge Cup Fund; this entitles the Regiment to send a team each year to play in the Tournament the winner of which will in future hold a cup provided out of these subscriptions. Any regiment not subscribing and wishing to enter will have to pay £10 in addition to the usual rupees 100 for the expenses of the year.

The number of subscribers to the Fund June, 1894 = 614.

" " " " " May, 1895 = 639.

The report having been adopted and the accounts passed, it was resolved to invest the sum of £300 in some stock to be selected by the Committee, and to deposit the balance of £500 in the Post Office Savings' Bank.

In the remarks that followed Major-General F. T. Lloyd, C.B., said he thought it a pity that the Committees of the R.A. and R.E. Games' Funds cannot come

to some agreement on the question of providing a Cup for the inter-regimental golf matches.

ACCOUNTS OF R.A. GAMES' FUND.

EXPENDITURE.				RECEIPTS.			
	£	s.	d.		£	s.	d.
Grants—Lawn Tennis Courts, Exeter ...	3	0	0	Credit brought forward, cash in Secretary's hands	...	1	1 4½
—Stické Courts, Fort Grange ...	15	0	0	" " " Cox & Co.'s "	...	527	18 3
" —Yacht, Gibraltar ...	10	0	0	Subscriptions, 1894—Cox & Co., 1st list ...	...	173	10 6
" —Beagle Kennels Weymouth ...	10	0	0	" " " 2nd list ...	...	5	5 0
" —Stické Court, Dover ...	25	0	0	" " " 3rd list ...	...	6	7 0
" —Officers' Cricket Ground, Quetta ...	15	0	0	" " " Credited direct ...	...	3	16 0
" —Racing Yacht, Hong Kong ...	25	0	0	" " " —Per Secretary, received direct ...	...	2	14 0
" —(2nd) Stické Court, Fort Westmoreland	15	0	0	Recredit portion of grant to Dover ...	...	10	0 0
Refund Subscriptions—Direct	0	10	0				
" " —Cox & Co.	1	7	0				
Clerk ...	2	15	0				
Postage, Telegrams and Printing	1	12	0				
Officers' expenses, Rackets and Billiards	0	18	0				
	0	14	0				
	1	14	7				
	2	15	0				
	5	5	9				
	1	9	1				
Racket Court expenses do. ...	17	3	5				
	7	6	8				
	3	10	7				
Band expenses ...	0	10	0				
	1	0	0				
Credit { Balance cash in Secretary's hands ...	4	18	8				
" " at Cox & Co. ...	574	13	1				
Total ...	730	12	1½	Total ...	...	730	12 1½

1st January, 1895.

NOTES

FROM

CORRESPONDING MEMBERS.

NOTE.

THE notes on "Magazine Regulations" communicated by D.-A.-A.-G., R.A. and published in the September number of the "Proceedings," were intended as notes on Major R. F. Johnson's paper on the "Ammunition Service of a Fort;" the publication of these notes separately, was due to a misunderstanding; and as they have now been inserted in their proper place, members are requested to cancel p. 483 of the September number of "Proceedings."

THE Committee of the Engineering Congress held in Chicago in 1893, have collected a small number of the proceedings of the Military Engineering group; some copies are kindly offered to members of the R.A. Institution at the small charge of 2s. 6d. a copy and postage. Officers wishing to obtain a copy, should write to the Publisher of "Engineering," 35, Bedford Street, Strand, London, enclosing a remittance of 3s. 2d.

H.R.H. THE DUKE OF CAMBRIDGE, Commander-in-Chief has accepted an invitation to dine with the Regiment at the R.A. Mess, Woolwich on the 9th of November. Any officer wishing to be present, who has not received an intimation through a Mess or otherwise, is requested to notify his desire to dine to the Hon. Sec. R.A. Mess, Woolwich.

R.A. POINT-TO-POINT RACES, 1895.

FROM a sporting point of view the first attempt at a regimental point-to-point meeting was a complete success, and it is therefore hoped that it may become an annual event.

There were more than twenty starters in both the regimental races, and the secretary, having paid all bills, finds himself with about £56 in hand.

On this head, however, it is only fair to remember that this year, owing to the kindness of Mr. Tyndale White, secretary of the Essex Hunt, the expenses for damage were unusually small.

Of course the future success of the meeting is mainly a question of finance. This year, the support afforded, especially from Woolwich and Aldershot, was most generous. Begging for money, however, for what purpose, is always unpleasant, especially when there is a danger of people feeling any obligation to give. I venture to think too, that, if the effort to collect money has to be made each year, there would be some difficulty in getting anyone to perform the duties of secretary.

The amount of money required is not large, and might be met, should the regiment approve, in the following manner without seriously interfering with any other subscriptions. This suggestion, for which there is the authority of the General Meeting held in London on Friday, 7th June, is that officers commanding batteries and companies, serving at home, should guarantee £1 per annum to the R.A. point-to-point fund at Messrs. Cox & Co. This, which would only cost each individual officer some four or five shillings, would suffice to keep the fund solvent.

Should any other officers (not serving with batteries or companies) desire to become subscribers, they are requested to write to Messrs. Cox & Co. Their subscriptions will be very welcome, and will be acknowledged annually in the published accounts.

Officers commanding batteries and companies would be doing a great kindness by letting the Hon. Secretary know their views, whether they are in favour of this suggestion or not, as early as possible.

It was feared by some that we are likely to interfere with the Royal Artillery steeplechases. The success of both events this spring, proved, I think, that there is room in the regiment for both.

The following conditions were agreed to at the General Meeting.

The stewards to be the same as last year (with the addition of Lieut.-Colonel Yorke, the master of the R.A. drag hounds), with power to add to their number, viz :—Lieut.-Col. Wallace, R.H.A.; Lieut.-Col. O'Malley, R.A.; Lieut.-Col. Yorke, R.A.; Major Eustace, R.H.A.; Major Blewitt, R.A.; Captain W. Paget, R.H.A.; Captain J. L. Smith, R.A.; Captain J. B. Askwith, R.A.; and Captain C. G. Mackenzie, R.A., Aldershot, Hon. Secretary.

The horses entered to be maidens (winners of the R.A. light weight and R.A. heavy weight race excepted), to have been the property of their owners since the 1st February preceding the race, and to have been regularly hunted by them during the past season.

Other conditions the same as this year.

The time and place and any other point which may arise to be left absolutely to the stewards, whose decision is to be final. Three stewards to form a quorum.

"I should like to add the following to the above circular which, with the authority of the General Meeting of R.A. races, was sent to officers commanding batteries and companies. Most of the replies received have been favourable, and I think that some of the few adverse letters have been caused by a misconception, for which, I dare say, my clumsy wording has been responsible.

The primary reason of the suggestion was a desire to make individual subscriptions as small as possible, the secondary reason to give the secretary some line to go on, as to the probable amount of his subscription list for the coming year, so that the financial part of the business might work automatically. Of course it was never intended that a commanding officer should be asked to pledge the credit of his battery, even to the amount of one sovereign, indefinitely. He was only asked to promise that amount for one year. As soon as the subscription was disapproved of by the officers of the battery it could be withdrawn.

All that was asked was that this battery should undertake to subscribe £1, the matter of collection being left entirely to the officers of the battery, and the suggestions were circulated with the belief that all our batteries, and many of our companies, have two or three officers at least serving in them who are interested in hunting, and may not object to subscribe a small amount for a purely hunting fixture." C. G. Mackenzie, Capt., Hon. Secretary.

SINGAPORE.—STRAITS SETTLEMENTS.

THE R.A. quartered in the island of Blakang Mati are about to have new quarters and mess premises built for them. For the last five years or more, both officers and men have been living in sheds thatched with atap palm leaves, whilst the Colony and the Home Government fought over the amount of the Military Contribution, but now this question has been practically settled, and the Colonial Government have commenced building the new barracks.

The old mess and quarters had many discomforts which have been celebrated in verse and song by the marooned subaltern condemned to live on the island

whilst his more fortunate brother was having a fairly good time in the head-quarter mess at Fort Canning. When heavy rain came (and it knows how to rain in this part of the world) the roof was much too hospitable to keep it out, and one had to get up and push the bed round the room to dodge the wet. To add to this, the atap was the happy home of the white ant, the scorpion, and the centipede, and one could never claim to feel very lonely.

The last reorganisation of the R.A. results in having two companies of Artillery stationed here, 25th Company which is quartered on Blakang Mati, and 38th Company at Fort Canning. Major Wace, R.A., D.S.O. and 2nd Lieutenant Griffith are coming out next month to join the latter company, which will then be up to full strength.

The R.A. in the Straits possess a capital football team which has just won the Singapore Association Football Challenge Cup in grand style, ultimately defeating the runners up by three goals to one. This cup competition has a rather curious history. Last year the two teams left in the final were the 1st and 2nd teams of the 2nd Battalion Lincolnshire regiment, now quartered at Woolwich, and these two teams tied no less than seven times and finally decided the competition by tossing. This year the R.A. met in the final the team entered by the 5th Northumberland Fusiliers. The latter were the favourites, the betting being about 2 to 1. The game resulted in a very fine exhibition of football, the short passing and shooting of both teams being very good indeed. Where so much good play was shewn, it would be difficult to single out particular individuals for praise, but such play as was shewn by the R.A. backs is rarely witnessed in the East.

The command of the Singapore Company, R.A. has just changed hands. Lieutenant J. G. M. Watson, who formerly served in Singapore in 26th Company, Southern, relieves Lieutenant Corrie, who goes to a native mountain battery in India.

Major Hawkins, R.E. and Lieutenant Paul, R.A. have just returned from Muar (Johor) through Malacca, after climbing Mount Ophir, said to be the Ophir of the bib'e from whence King Solomon brought gold and peacocks. It is only a little over 4000 feet high, but it is the highest mountain in the Malay Peninsula, south of Perak, and a very fine view can be obtained from the summit. They failed to bring back any talent of gold with them, but some very pretty orchids and ferns were brought down.

In another month or so the snipe season will have commenced. No bags of any size are made in Singapore, but Malacca, Penang, and Province Wellesley are said to be the best snipe grounds in the world, and a good bag can always be made by a fair shot.

Lieutenant J. T. MacDougall has returned, after a fortnight's leave, to Java. He reports the climate as delightful, especially in the hills, the food good, and the hospitality unbounded. Some very good shooting can be obtained in the island with a little trouble, and in Batavia, cricket, and golf are merrily played all the year round.

OBITUARY.

MAJOR J. M. SIMPSON (retired), who died on the 16th September, 1895, joined the Regiment, as Lieutenant, 17th August, 1874; became Captain 12th September, 1883; and Major 7th November, 1891. He was placed on temporary half pay, owing to ill health, 20th January, 1895, and retired 7th August, 1895.



CRICKET 1895.

ROYAL ARTILLERY v. ROYAL ENGINEERS. PLAYED AT CHATHAM, 19TH AND 20TH JULY.

ROYAL ENGINEERS.

Major Friend, c Adair, b Straubenzee...	123
Capt. W. C. Hedley, c Foster, b Waymouth	30
E. M. Blair, c Curteis, b Waymouth	15
Captain Hamilton, c Straubenzee, b Holloway	58
M. O.C. Tandy, c Quinton, b Straubenzee...	50
Major Renny-Tailyour, b Waymouth	33
Capt. Druitt, c Waymouth, b Quinton	4
E. H. Rooke, c Curteis, b Straubenzee	53
C. B. O. Symons, b Waymouth	23
F. G. Turner, run out	11
Major Rawson, not out	10
Extras	27

Total ... 437

Royal Artillery: J. M. Macgowan (not out), 13; Captain Adair (not out), 5; extras, 1. Total (for no wicket), 19. W. Strong, W. L. Foster, F. W. D. Quinton, C. C. Van Straubenzee, Capt. Wynne, Major Curteis, C. H. de Rougement, W. O. Holloway, and E. G. Waymouth did not bat.

ROYAL ARTILLERY v. GENTLEMEN OF M.C.C. PLAYED AT LORDS, 22ND AND 23RD JULY.

GENTLEMEN OF M.C.C.

1st Innings.

A. E. Stoddart, c Waymouth, b Holloway	28	not out
G. F. Vernon, c Perkins, b Holloway	9	
Capt. E. G. Wynyard, c Wynne, b Straubenzee	72	
Capt. H. B. Trevor, run out	29	
E. C. Mordaunt, b Macgowan	26	
J. M. Quinton, c Waymouth b Macgowan	3	
Capt. Phipps-Hornby, not out	15	not out
C. Heseltine, b Straubenzee	5	
Lieut.-Col. Rice, c Quinton, b Holloway	9	
Archibald Campbell, c and b Holloway	1	
F. Walkinshaw, c Quinton, b Straubenzee	0	
Extras	3	

Total ... 200

2nd Innings.

...	20
...	
...	
...	
...	
...	
...	
...	
...	
...	
...	
Extras	3

Total (for no wickets)... 23

ROYAL ARTILLERY.

1st Innings.

Capt. Wynne, b Stoddart	2
C. C. Van Straubenzee, b Mordaunt	1
Major Curteis, c Walkinshaw, b Mordaunt	15
F. W. D. Quinton, c Wynyard, b Mordaunt	7
Capt. Adair, not out	3
W. Strong, c Walkinshaw, b Campbell	28
Capt. Dorehill, c Wynyard, b Mordaunt	0
A. E. J. Perkins, b Mordaunt	0
W. O. Holloway, c Walkinshaw, b Mordaunt	1
E. G. Waymouth, c Walkinshaw, b Mordaunt	14
J. M. Macgowan, c Trevor, b Mordaunt	0
Extras	9

Total ... 80

2nd Innings.

c Heseltine, b Campbell	1
b Stoddart	8
b Mordaunt	10
c Wynyard, b Mordaunt	0
b Mordaunt	0
c Walkinshaw, b Mordaunt	10
lbw, b Mordaunt	1
not out	52
run out	23
c Wynyard, b Stoddart	3
run out	15
Extras	18

Total ... 141

ROYAL ARTILLERY *v.* FREE FORESTERS.
PLAYED AT WOOLWICH, 26TH AND 27TH JULY.

ROYAL ARTILLERY.

1st Innings.

C. C. Van Straubenzee, c Ingram, b Collins...	12
Capt. Wynne, b Collins	6
Major Curteis, b Hornsby	0
A. E. J. Perkins, b Collins	1
R. A. Craig, c and b Collins	0
Capt. Adair, b Hornsby	11
F. H. G. Stanton, c Lewes, b Collins	9
W. O. Holloway, c Gillman, b Collins	13
Capt. Phipps-Hornsby, b Hornsby	1
K. St. G. Kirke, b Collins	0
Capt. Crampton, not out	0
Extras	7

Total 60

FREE FORESTERS.

1st Innings.

J. H. Hornsby, c Craig, b Holloway	8
P. F. Warner, c Holloway, b Kirke	19
D. F. Gillman, b Holloway	9
G. J. Mordaunt, c Wynne, b Holloway...	59
F. M. Ingram, b Holloway	32
Lieut.-Col. Rice, b Holloway	0
H. H. Harrington, c Holloway, b Kirke	0
B. Atkinson, not out	31
C. M. Woodbridge, b Holloway	2
W. E. W. Collins, c Wynne, b Holloway	9
R. P. Lewis, b Holloway	0
Extra	13

Total 182

2nd Innings.

c Ingram, b Collins	40
b Gillman	9
b Hornsby	5
c Hornsby	13
b Hornsby	25
b Collins	4
c and b Gillman	3
c Ingram, b Hornsby	0
b Hornsby	4
not out	16
b Collins	9
Extras	11

Total 139

2nd Innings.

not out	7
not out	10
Extras	4

Total (for no wickets) ... 21

ROYAL ARTILLERY *v.* BAND OF BROTHERS.

PLAYED AT WOOLWICH, 2ND AND 3RD AUGUST.

BAND OF BROTHERS.

1st Innings.

A. W. Fulcher, b Kirke	27
A. M. Streetfield Moore, b Moorhouse	0
Rev. W. Rashleigh, b Kirke	6
G. J. Mordaunt, c and b Dorehill	17
G. C. Hubbard, c and b Kirke	19
E. Fisher, c Craig, b Kirke	11
M. C. Kemp, lbw, b Moorhouse	0
C. V. Isaacke, b Moorhouse	0
C. Watney, c and b Moorhouse	1
J. E. Jones, not out	4
F. S. W. Cornwallis, b Moorhouse	3
Extras	11

Total 99

2nd Innings.

b Moorhouse	26
b Straubenzee	44
c and b Kirke	77
c Perkins, b Moorhouse	2
c Straubenzee, b Moorhouse	11
st Cooper, b Moorhouse	4
c Craig, b Moorhouse	21
b Moorhouse	4
b Moorhouse	0
not out	19
not out	30
Extras	11

Total 249

ROYAL ARTILLERY.

C. C. Van Straubenzee, st Kemp, b Rashleigh...	41
R. A. Craig, c Fisher, b Hubbard	29
Major Curteis c and b Hubbard	1
Capt. Dorehill, lbw, b Rashleigh	7
Capt. Cooper, b Hubbard	30
Capt. Wynne, b Jones	74
A. E. J. Perkins, b Jones	11
H. C. Moorhouse, c Fulcher, b Jones...	0
L. K. Stanbrough, not out	17
Bmbdr. Osmond, b Jones	3
K. St. G. Kirke, c and b Fisher	14
Extras	10

Total... .. 240

ROYAL ARTILLERY v. I. ZINGARI.
PLAYED AT WOOLWICH, 7TH AND 8TH AUGUST.

ROYAL ARTILLERY.

<i>1st Innings.</i>				<i>2nd Innings.</i>			
C. C. Van Straubenzee, c Wheble, b Morgan	...	...	24	c DuCane, b Mitchell	...	...	4
Capt. Cooper, c Wheble, c Mordaunt	...	...	5	b Mitchell	...	...	0
Major Curteis, b Morgan	...	...	43	b Mitchell	...	...	24
R. A. Craig, b Morgan	...	...	0	b Hornsby	...	...	4
R. A. Birley, c Mitchell, b Morgan	...	...	21	c and b Turner	...	...	10
A. E. J. Perkins, b Mitchell	...	...	4	c and b Hornsby	...	...	14
E. J. R. Peel, b Mitchell	...	...	7	b Soames	...	...	1
W. O. Holloway, c Mitchell, b Morgan	...	...	4	not out	...	...	29
H. C. Moorhouse, b Mitchell	...	...	0	c DuCane, b Mitchell	...	...	1
E. G. Waymouth, not out	...	...	6	c Soames, b Hornsby	...	...	9
Major Abdy, b Mitchell	...	...	0	b Hornsby	...	...	11
K. St. G. Kirke, b Mitchell	...	...	2	c Wheble, b Hornsby	...	...	3
Extras	...	...	7	Extras	...	...	10
Total	...	...	123	Total	...	...	120

I. ZINGARI.

<i>1st Innings.</i>				<i>2nd Innings.</i>			
Capt. DuCane, lbw, b Waymouth	...	...	4	st Cooper, b Kirke	...	...	26
J. H. J. Hornsby, b Holloway	...	...	6	c Holloway, b Waymouth	...	...	16
E. C. Mordaunt, b Holloway	...	...	0	b Moorhouse	...	...	19
F. A. Soames, b Holloway	...	...	1	c Craig, b Moorhouse	...	...	9
W. Morgan, b Holloway	...	...	12	b Moorhouse	...	...	5
L. K. Jarvis, b Waymouth	...	...	5	b Kirke	...	...	8
J. A. Turner, b Waymouth	...	...	3	b Moorhouse	...	...	1
Capt. Wheble, c Curteis, b Holloway	...	...	0	b Kirke	...	...	5
G. F. Vernon, b Waymouth	...	...	1	st Cooper, b Kirke	...	...	7
J. Hargreaves, b Holloway	...	...	22	b Kirke	...	...	0
R. H. Mitchell, c and b Waymouth	...	...	1	not out	...	...	7
R. W. Mitchell, not out	...	...	1	b Kirke	...	...	6
Extras	...	...	3	Extras	...	...	2
Total	...	...	59	Total	...	...	111

NOTES

FROM

CORRESPONDING MEMBERS.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below :—

Major-General Stubbs's "List of Officers of the Bengal Artillery," price 5s. 3d.

"Field Artillery Fire," by Captain W. L. White, R.A., price 1s. 2d.

"Notes of Lectures on Artillery in Coast Defence," by Major A. C. Hansard, R.A., price 1s. 2d.

"Ranging Note-Book," by Captain S. W. Lane, R.A., price 1s. 1d.

"Achievements of Field Artillery," by Major E. S. May, R.A., bound, price 2s. 6d.

"The Value of Mobility for Field Artillery," by Major E. S. May, R.A., paper covers, price 3d.

"The Young Officer's 'Don't,' or Hints to Youngsters on Joining," by an Officer R.A., price 7d.

The two Numbers of "Nature" containing Professor C. V. Boys's Lecture on "Photography of Flying Bullets," fully illustrated, price 8d.

Examination questions in (c), (d), and (e) set in the four examinations ending May 1893 :—

Captains (c) and (d) ... price 1s. 1d.

Lieutenants (c) (d) and (e) price 1s. 1d.

Tables of Four-Figure Logarithms, pocket edition, mounted on linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid down for inspection, price for pair (lead and wheel), 1d.

THERE is a movement on foot to erect a memorial to all who fell in the Matabele campaign, more especially to the late Captain C. F. Lendy, Royal Artillery, over his grave. A public subscription is now being made in Bulawayo for this purpose.

Any officer wishing to subscribe should send his subscription to the "Civil Commissioner," Bulawayo.

THE name of Major H. C. L. Holden R.A. appeared in the last list of Fellows elected to the Royal Society. The office at the Proof Butts Royal Arsenal fitted

with many of the electrical measuring and recording instruments invented by Major Holden has for some time past been one of the principal objects of interest to societies and men of science visiting the Arsenal. Major Holden deserves the congratulations of the Regiment on the honour done him by the Royal Society.

THE Secretary R.A.I. has received a letter asking to withdraw the essay bearing motto "'Tis never too late to mend" from the Duncan Gold Medal competition 1895. This has been done.

SHEERNESS.

SINCE last notes the following changes amongst the officers have occurred. Major A. S. Pratt and Lieutenant Byron have gone to Field Artillery, both much missed; Major R. M. B. F. Kelly has joined as Instructor in Gunnery vice Major Pratt and 2nd Lieutenants Blount and Barnes to fill vacancies.

As a mark of appreciation for the use of the R.A. golf links the golfers of the Royal Navy presented a silver flask to be played for under handicap. This was played for on Tuesday 27th April, the competition being match play against Bogey, the flask was won by Captain Cummings, at scratch, who made a record for these links, 40 first round and 41 second round of 9 holes, beating Bogey by 6 up. The second prize, sweepstake, was won by Lieut.-Colonel Uppleby, who with a stroke at 9 holes was 4 up with Bogey.

Golf has now to be given up for the summer, making way for cricket, tennis and polo.

The R.A. polo club has opened stronger than ever, 4 quarters twice a week being easily arranged for, there being 20 ponies already and more expected; the field has greatly improved since last year and a good season is anticipated.

The officers of the Dutch Royal Yacht "Valk" were entertained at dinner in the mess prior to Her Majesty's departure, the table being very tastefully decorated with red, white and blue flowers arranged in stripes as a compliment to the Dutch national flag.

The mess plate has been enriched by the gift of a very handsome silver milk jug, matching a coffee pot in use, by Lieutenant Frank Rundle, R.E. lately gone to India.

Three gentlemen cadets, Stanbrough, Castle and Lennox, are attached here awaiting commissions so that the mess is as full as it will hold, every room in the officers' quarters being occupied.

The Cricket season opened with a match against R.A. Dover on 11th May, in which the Sheerness eleven were defeated by 24 runs. For Sheerness Captain E. F. Hall distinguished himself by making 59 out of the 99 total. The match was played at Dover and the visitors were hospitably entertained at luncheon in the R.A. mess.

OBITUARY.

GENERAL H. P. *Baron* DE TEISSIER, Colonel Commandant, who died at Leatherhead, on 27th May, 1895, joined the Bengal Artillery as 2nd Lieutenant, 11th December, 1837; became Lieutenant, 17th August, 1841; Captain, 11th December, 1852; Lieut.-Colonel, 18th February, 1861; Colonel, 18th February, 1866; Major-General, 1st October, 1877; Lieut.-General, 1st September, 1881;

General; 31st March, 1883; and Colonel Commandant, 7th June, 1888. General de Teissier served in the Sutlej campaign, 1846, and was present at the battle of Sobraon (medal). Punjab campaign, 1848-49; battles of Chillianwallah, and Goojerat (despatches, *London Gazette*, 3rd March, 1849, medal with 2 clasps).

GENERAL SIR J. W. FITZMAYER, K.C.B., Colonel Commandant, whose death occurred at Ross, Herefordshire, on 27th May, 1895, was the son of an officer Royal Artillery; he was commissioned as 2nd Lieutenant, 6th November, 1830; became Lieutenant, 26th October, 1831; 2nd Captain, 12th April, 1842; Captain, 9th November, 1846; Major, 20th June, 1854; Brevet Lieut.-Colonel, 20th June, 1854; Brevet Colonel, 2nd November, 1855; Major-General, 29th December, 1867; Colonel Commandant, 26th November, 1876; Lieut.-General, 15th April, 1877; and General, 1st October, 1877. General Fitzmayer served during the Crimean campaign 1854-55, was present at the affairs of Bulganac, and McKenzies Farm; battles of Alma, Balaclava, and Inkerman; siege and fall of Sebastopol; and repulse of Sortie, 26th October, 1854 (despatches, *London Gazette*, 10th October, 12th November, and 2nd December, 1854; medal with 4 clasps; Brevet of Colonel, C.B.; Officer of Legion of Honor; 4th class of Medjidie; Turkish medal.) He was Inspector General of Artillery from 1st April, 1875, to 31st March, 1877, and appointed Colonel Commandant Royal Horse Artillery, 7th December, 1886.

LIEUTENANT G. V. GREEN, who died at Bombay on 19th April, 1895, was commissioned as Second Lieutenant, 25th July, 1890, and became Lieutenant 25th July, 1893.

THE death is reported through the capsizing of a yacht off Southend-on-Sea, on 16th May, 1895, of Second Lieutenant F. M. Marston, commissioned 20th March, 1895.

NOTES

FROM

CORRESPONDING MEMBERS.

“DUNCAN” GOLD MEDAL PRIZE ESSAY, 1896.

THE Subject approved by H.R.H. The Commander-in-Chief for the “Duncan” Gold Medal Prize Essay, 1896, is as follows :—

“Ammunition Columns and Parks, considered with reference to the replacement of ammunition, horses and men during and after an action.”

The Rules for the Prize Essays now read :—

The Annual Gold Medal, when awarded, to be accompanied by an *honorarium* of £20; the Silver Medal by an *honorarium* of £10.

The candidates must be Officers of the Regiment who are members of the R.A. Institution.

Officers are requested to confine their Essays to about 16 printed pages of the “Proceedings;” other things being equal brevity will count towards success.

The Essays must be forwarded to the Secretary so as to reach him on or before the 1st of April.

Each Essay must be *type-written* in triplicate. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written outside and the name of the writer inside; further, if the writer wishes to recover from the Committee part of the cost of type-writing his Essay he should state this fact in the same sealed envelope and write outside it, above the motto, “to be opened.”

All the envelopes thus marked will be opened by the Secretary after the result of the competition has been announced, and he will send the writers the money for their type-writing expenses.

The Committee will allow a sum of £1 for type-writing each Essay.

The Essays will be submitted for decision to three Judges chosen by the Committee.

The Judges are empowered to recommend :—

1. That two Medals, one Gold and one Silver, be awarded, or
2. That only one Medal, Gold or Silver, according to the merit of the Essay, be awarded, or
3. That no Medal be awarded.

The names of the successful candidates will be announced at the Annual Meeting, and Medallists will be distinguished as such in all Lists, &c., issued from the Institution; and in the event of a University man gaining a Medal, a report of his success will be made to the University of which he may be a member.

The successful Essays will be printed and circulated to members by the Institution.

N.B.—The Committee draw particular attention to the paragraph in the Rules above on the subject of length of Essays; it is not difficult to discover the number of words in an average page of “Proceedings” matter, and so to keep an Essay within the 16 pages’ limit.

THE following works are now on sale at the R.A. Institution and will be forwarded post free at the prices noted after their titles below :—

“Twenty-four hours of Moltke’s Strategy” by Fritz Hoenig.
Translated by Colonel N. L. Walford, price 5s.

Major-General Stubbs’s “List of Officers of the Bengal Artillery,”
price 5s. 3d.

“Field Artillery Fire,” by Captain W. L. White, R.A., price
1s. 2d.

“Notes of Lectures on Artillery in Coast Defence,” by Major A.
C. Hansard, R.A., price 1s. 2d.

“Ranging Note-Book,” by Captain S. W. Lane, R.A., price 1s. 1d.

“Achievements of Field Artillery,” by Major E. S. May, R.A.,
bound, price 2s. 6d.

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linen, price 3d.

Lithographic plates of Field Artillery Harness stripped and laid
down for inspection, price for pair (lead and wheel), 1d.

R.A. (WOOLWICH) POLO CLUB.

A Handicap Tournament was played off as follows ; the teams having been selected so as to be as equal as possible.

No. 3 Team.	v.	No. 2 Team.
Back. Captain Blane,		Mr. Aldridge,
3 „ Lachlan,		Major Manifold,
2 Mr. Gillson,		Mr. Peel,
1 „ Butler.		Captain Maxwell.

No. 2 team were not at all in their best form, and were beaten by five goals to love. Mr. Gillson did most of the work for the winners, and was well supported by Captain Blane as back.

No. 4 Team.	v.	No. 5 Team.
Back. Captain Heygate,		Captain Hanwell,
3 Major Cunliffe,		Mr. Harman,
2 Mr. Head,		Captain Schofield,
1 „ Pim.		Mr. Browne.

This proved a much more equal match. No. 4 won by two goals to one, but the

losers had rather the best of the match. Mr. Pim devoted his time to keeping Captain Hanwell out of the game, and thereby did much towards victory.

NO. 1 TEAM DREW A BYE.

Second Round.

No 1 Team.		v.	No. 4 Team.	
Back.	Captain Honner,			Captain Heygate,
3	„ Tisdall,			Major Cunliffe,
2	„ Ferrar,			Mr. Head,
1	„ Hon. J. Vereker.			„ Pim.

Another good game in which No. 1 eventually won by two goals to love. Captain Tisdall was originally intended as "back," but Captain Honner producing a good pony filled the place most successfully and so allowed Captain Tisdall to go up.

Final.

No. 3 Team.		v.	No. 1 Team.	
Back.	Captain Blane,			Captain Honner,
3	„ Lachlan,			„ Tisdall,
2	Mr. Gillson,			„ Ferrar,
1	„ Butler.			„ Hon. J. Vereker.

This proved the best match of the Tournament. No. 3 team thanks chiefly to Mr. Gillson had rather the best of the game, and near the end of time were two goals to one. Just before the bell rang No. 1 team scored and so equalised matters.

In playing off the tie, No. 2 team scored the first goal and so won the Tournament.

Captain Blane was again 'all there' as back, while Captain Tisdall and Captain Ferrar did a lot of work for the losers.

Mr. Butler had the honor of hitting the deciding goal.

POLO IN PARIS.

A team of R.A. officers from Woolwich, very sportingly went over to play for the International Cup, given by the Paris Club. They were defeated by the Rugby team by six goals to three. The winners were exceptionally well mounted, which gave them a great advantage. The R.A. team however played a good game, especially in the 2nd and 3rd quarters.

After this defeat, Baron de Rothschild kindly offered a prize for a match between them and the Paris Club. This took place on the 7th June, the sides were as follows:

R.A.		v.	PARIS CLUB.	
1	Mr. Peel,		1	Monsieur Bousod,
2	„ Gillson,		2	„ De le Escandon,
3	„ Aldridge,		3	Lord Shrewsbury,
Back.	Captain Hanwell.		Back.	Mr. Wheeler.

The R.A. began by pressing the home team but failed to score for the first two quarters. Then the Paris team playing well together, brought the ball down the ground with one run, and Captain Hanwell having broken his stick, they scored the first goal, this put the visitors on their mettle, and Captain Hanwell went up to No. 3, leaving Mr. Aldridge back; the change soon told, as Captain Hanwell very quickly scored two goals. During the last part of the game the R.A. still

continued to have things their own way, Mr. Peel and Mr. Gillson each adding another goal, the match thus ended in favor of the visitors by four goals to one.

At the conclusion of the game the prizes, which consisted of four gold cigarette cases, were presented by Viscomte Charles de la Rochefoucauld, the President of the Paris club, who congratulated the winners, and said he hoped the R.A. would pay them another visit next year. Captain Hanwell in reply thanked the Paris Club for the great hospitality they had shown his team, and Baron de Rothschild for his kindness in giving the prize they had had the honor of winning.

R.A. WOOLWICH GYMKHANA MEETING.

THE Meeting took place on the Polo Ground in Charlton Park, on 14th June, and was attended by some two or three hundred people.

THE COCKSHY STAKES.—Won by "G" Battery R.H.A., the Paris Polo Team being second, no less than ten teams competed.

Captain Chapman, Mr. Powell, Mr. Best, and Mr. Butler.....	1
Captain Hanwell, Mr. Peel, Mr. Gillson, and Mr. Aldridge	2

POLO BALL RACE.—The ball had to be taken through obstacles, round a post and back through a goal.

Mr. Aldridge	1
Major Manifold	2
Mr. Gillson	3

12 Competed.

THE AFFINITY STAKES.—Gentlemen to saddle pony or horse, open umbrella, run to lady, who will light his cigar, thread a needle and sew a button on to his coat. Gentlemen must then return to pony, mount, ride round a flag and back to winning post, with umbrella open, cigar alight and button on.

Mrs. Rupert Clarke and Captain Hanwell	1
Mrs. Pratt and Major Pratt.....	2

18 Competed.

Captain Hanwell got his saddle on quickest, and thanks to his partner's rapidity with the button and light for his cigar, won comfortably, from Major and Mrs. Pratt.

POLO SCURRIES.—The first race for English Ponies was won by

Captain Heygate's HALMA	Mr. GILLSON 1
-------------------------------	---------------

Captain Heygate and Captain Schofield led into the straight, but running wide at the turn by the pony stables, were carried right into the carriages. Captain Heygate had a nasty fall but was very pluckily up to time to compete in the next event.

The Second Race for all Eastern Ponies was won by

Mr. Peel's RAYON D'OR	OWNER 1
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After a very close finish with Captain Minchin on one of Captain Tisdall's.

TENT-PEGGING BY SECTIONS.—The 1st Division R.H.A. defeated the 2nd Division F.A.

Mr. Powell, Mr. Dixon, Mr. Vallentin, Mr. Hooper	1
Captain Hanwell, Mr. Clarke, Mr. Thwaites, Mr. Tyler.....	2

After the competition two sections tent-pegged from different directions passing

through each other as they took the pegs. Then in Indian file passing each other bridle hand to bridle hand. Captain Hanwell finished the entertainment by taking a peg, while standing up on the saddle.

THE "GRETNNA GREEN" STAKES.—Gentlemen to ride a horse or pony, leading another with side saddle to the pavilion, where the expectant brides will be waiting in fancy costume. Gentlemen to dismount, help bride to mount, then both will ride over a hurdle to a table, where they must dismount and sign their names, and mount again, returning over hurdles. First pair back to win.

Mr. Straubenzee and 'Miss' Metcalfe.....	1
Captain Chapman and 'Miss' Best	2
Mr. Ashmore and 'Miss' England	3
Captain Hanwell and 'Miss' Gillson	0
Mr. Parry and 'Miss' Dixon	0
Captain Maxwell and 'Miss' Stanton	0
Mr. Vallentin and 'Miss' Aldridge	0

This caused a great deal of amusement, the brides in most cases being too lovely for words.

OBITUARY.

COLONEL G. G. CHANNER (retired), died at Ealing, 7th July, 1895. He joined the Bengal Artillery as Second Lieutenant, 13th December, 1827; became Lieutenant, 1st December, 1834; Brevet-Captain, 13th December, 1842; Brevet-Major, 20th June, 1854; Lieut.-Colonel, 27th August, 1858; and retired 10th October, 1858, with the hon. rank of Colonel.

LIEUT.-COLONEL H. M. SMITH (retired), whose death occurred at Bromley-by-Bow, on the 7th July, 1895, was first commissioned as Second Lieutenant in the Bengal Artillery on 12th December, 1845; became Lieutenant, 21st July, 1851; Second Captain, 27th August, 1858; First Captain, 13th January, 1864; Major, 5th July, 1872; and retired with the hon. rank of Lieutenant-Colonel, 1st August, 1872. Lieutenant-Colonel Smith served on the Indian Frontier during 1851-2 (medal and clasp).



CRICKET 1895.

ROYAL ARTILLERY v. ALDERSHOT DIVISION.

PLAYED AT ALDERSHOT, 24TH AND 25TH MAY.

ROYAL ARTILLERY.

<i>1st Innings.</i>				<i>2nd Innings.</i>			
Capt. Adair, c Bradford, b Campbell	...	...	6	c Bradford, b Campbell	...	...	0
C. C. Van Straubenzee, c Luard, b Bradford	..	...	8	b Shute	...	...	33
Capt. de Rougemont, c Trevor, b Shute	...	...	36	c McLaren, b Campbell	...	...	16
Major Curteis, c Bradford b Shute	...	...	30	b Campbell	...	...	69
Capt. Wynne, b Shute	...	...	34	not out	...	...	142
J. E. Cairnes, b Bradford	...	...	8	b Campbell	...	...	2
E. E. N. Waters, c Ritchie, b Bradford	...	...	17				
R. A. Birley, c Ritchie, b Shute	...	...	6	not out	...	...	36
R. F. Ellice, b Bradford	...	...	9				
C. E. D. Budworth, run out	...	...	1				
Gunner Butler, not out	...	...	1				
Extra	...	...	9	Extras	...	...	20
Total	...	...	165	Total (for 5 wickets)	...	...	318

ALDERSHOT DIVISION.

Capt. Luard, c Curteis, b Butler	...	...	...	11
Lieut. Bradford, c Budworth, b Cairnes	...	...	...	62
" Campbell, c Adair, b Cairnes	...	...	...	30
Capt. Cuthbertson, b de Rougemont	...	...	...	24
Lieut. Ritchie, c Waters, b Budworth	...	...	...	32
Capt. Bunbury, c and b Budworth	...	...	...	50
Lieut. Pilkington, st Curteis, b de Rougemont	...	...	...	148
Lieut. Liddell c de Rougemont b Straubenzee	...	...	...	24
Capt. Trevor, b Cairnes	...	...	...	18
Capt. Shute, b Straubenzee	...	...	...	0
Corpl. McLaren, not out	...	...	...	7
Extras	...	...	...	13
Total	...	...	...	426

ROYAL ARTILLERY v. QUIDNUNCS.
PLAYED AT WOOLWICH, 13TH AND 14TH JUNE.

QUIDNUNCS.

<i>1st Innings.</i>				<i>2nd Innings.</i>			
H. Eaton, c Dorehill, b Waymouth...	...	...	64	c Butler, b Adair ...	...	...	41
E. H. Bray, c Adair, b Waymouth ...	...	...	0	b Waymouth ...	...	...	19
H. M. Leaf, c Adair, b Waymouth...	...	...	8	b Waymouth ...	...	...	12
C. G. Pope, b Holman ...	...	...	23	b Straubenzee ...	...	...	15
E. A. J. Maynard, b Butler ...	...	...	24	c Adair, b Waymouth ...	...	...	95
E. Garnett, not out ...	...	...	25	c Perkins, b Holman ...	...	...	26
H. Carew-Hunt, b Holman ...	...	...	18	not out ...	...	...	23
E. M. Lawson-Smith, b Holman ...	...	...	2	c Adair, b Holman ...	...	...	9
J. H. Manley, c and b Holman ...	...	...	0	b Waymouth ...	...	...	8
Rev. T. G. Greateorex, c Stanton, b Holman ...	...	...	17	c Dorehill, b Holman ...	...	...	19
A. E. Leatham, c Stanton b Waymouth...	...	...	14	c Perkins, b Waymouth ...	...	...	2
Extras...	...	...	5	Extras ...	...	...	10
Total ...	...	...	195	Total ...	...	...	279

ROYAL ARTILLERY.

<i>1st Innings.</i>				<i>2nd Innings.</i>			
Capt. Adair, c Bray, b Pope ...	...	...	13	c Carew-Hunt, b Pope ...	...	...	7
C. C. Van Straubenzee, c Garnett, b Lawson-Smith	...	...	59	b Pope ...	...	...	0
Major Curteis, b Pope ...	...	...	18	c and b Carew-Hunt ...	...	...	5
Capt. Dorehill, b Lawson-Smith ...	...	...	18	c Leatham, b Carew-Hunt ...	...	...	34
Capt. White-Thomson, b Carew-Hunt ...	...	...	23	b Garnett ...	...	...	26
F. H. G. Stanton, b Carew-Hunt ...	...	...	18	b Lawson-Smith ...	...	...	4
A. E. J. Perkins, c Garnett, b Pope ...	...	...	7	not out ...	...	...	29
B. W. Holman, c Lawson-Smith, b Pope ...	...	...	1	c Manley, b Pope ...	...	...	13
E. G. Waymouth, b Carew-Hunt ...	...	...	4	c Lawson-Smith, b Carew-Hunt ...	...	...	4
Major Abdy, not out ...	...	...	1	c Pope, b Carew-Hunt ...	...	...	7
Gunner Butler, b Carew-Hunt...	...	...	8	c Bray, b Leatham ...	...	...	9
Extras ...	...	...	18	Extras ...	...	...	4
Total ...	...	...	188	Total ...	...	...	142

ROYAL ARTILLERY v. ETON RAMBLERS.
PLAYED AT WOOLWICH, 17TH AND 18TH JUNE.

ROYAL ARTILLERY.

W. O. Holloway, b S. A. Foljambe ...	...	...	1
C. C. Van Straubenzee, b S. A. Foljambe...	...	...	13
Major Curteis, c Cobbold, b S. A. Foljambe	...	...	2
Capt. Adair, b Pelham ...	...	...	0
J. E. Cairnes, b Pelham ...	...	...	4
Capt. White-Thompson, c S. A. Foljambe, b Cobbold	...	...	43
Capt. Dorehill, b Cattley ...	...	...	68
A. E. J. Perkins, c Cobbold, b Cattley ...	...	...	24
E. G. Waymouth, not out ...	...	...	8
B. Atkinson, b S. A. Foljambe ...	...	...	8
Gunner Butler, c Cattley, b S. A. Foljambe	...	...	3
Extras ...	...	...	20
Total...	...	...	194

ETON RAMBLERS.

<i>1st Innings.</i>				<i>2nd Innings.</i>			
R. C. Gosling, b Holloway...	...	...	1	b Butler ...	...	...	23
V. W. Yorke, b Waymouth ...	...	...	4	c Adair, b Butler ...	...	...	0
P. W. Cobbold, c Perkins, b Waymouth...	...	...	5	b Butler ...	...	...	8
G. R. Hill, b Holloway ...	...	...	9	b Adair ...	...	...	0
S. W. Cattley, b Waymouth ...	...	...	25	c White-Thompson, b Adair ...	...	...	29
A. B. Whatman, b Waymouth...	...	...	0	b Waymouth ...	...	...	15
J. B. Pelham, b Waymouth ...	...	...	14	b Butler ...	...	...	0
G. S. Foljambe, b Waymouth ...	...	...	0	b Butler ...	...	...	4
S. A. Foljambe, b Holloway ...	...	...	1	b Butler ...	...	...	0
A. E. B. Ind, not out...	...	...	0	c Dorehill, b Adair ...	...	...	12
C. K. Pechell, c Adair, b Holloway...	...	...	0	not out ...	...	...	1
Extras...	...	...	5	Extras ...	...	...	4
Total ...	...	...	64	Total ...	...	...	96

ROYAL ARTILLERY v. ROYAL ENGINEERS.
PLAYED AT WOOLWICH, 21ST AND 22ND JUNE.

ROYAL ARTILLERY.

1st Innings.

C. C. Van Straubenzee, c Renny-Tailyour, b W.	
C. Hedley	68
Capt. Wynne, c Mainprise, b Hedley	30
Major Curteis, b Hedley	74
F. W. D. Quinton, c Stafford, b Rooke	7
W. Strong, b Druitt	72
Capt. Dorehill, c and b Rooke	2
Capt. White-Thompson, c Rooke, b Hedley	0
Capt. Adair, b Rooke	2
W. O. Holloway, b Hedley	2
E. G. Waymouth, c Hamilton, b Druitt	11
J. M. Macgowan, not out	28
Extras	27
Total	323

2nd Innings.

b Druitt	16
b Rooke	22
not out	31
c and b Druitt	4
not out	11
Extras	1
Total (for 3 wickets)	85

ROYAL ENGINEERS.

1st Innings.

Capt. W. C. Hedley, c Curteis, b Macgowan	44
E. M. Blair, c Curteis, b Waymouth	15
J. S. Liddell, b Macgowan	21
Capt. Hamilton, b Holloway	1
M. O'C. Tandy, c Curteis, b Waymouth	62
Major Stafford, b Macgowan	0
Major Renny-Tailyour, b Holloway	3
E. H. Rooke, b Holloway	16
B. W. Mainprise, b Waymouth	8
Major Rawson, b Holloway	14
Capt. Druitt, not out	6
Extras	6
Total	199

2nd Innings.

c Adair, b Waymouth	0
b Holloway	4
b Waymouth	1
c and b Waymouth	73
run out	89
b Waymouth	8
b Waymouth	13
run out	5
b Waymouth	7
b Macgowan	4
not out	0
Extras	3
Total	207

ROYAL ARTILLERY v. YORKSHIRE GENTLEMEN.
PLAYED AT WOOLWICH, 26TH AND 27TH JUNE.

ROYAL ARTILLERY.

1st Innings.

Capt. Wynne, c E. M. Lawson-Smith, b C. Lambton	73
C. C. Van Straubenzee, c E. B. Firth, b D. Lambton	24
Sergt.-Major Cochrane, c O. P. Sykes, b D. Lambton	0
Major Curteis, c Firth, b Sykes	66
W. L. Foster, c Sykes, b D. Lambton	9
A. E. J. Perkins, st Firth, b D. Lambton	35
J. E. Cairnes, b D. Lambton	85
H. C. Moorhouse, c C. Lambton, b Sykes	19
F. H. G. Stanton, c Firth, b Lawson-Smith	0
Capt. Handley, not out	12
Gunner Butler, b D. Lambton	4
Extras	23
Total	348

2nd Innings.

b Fox	0
b Lawson-Smith	21
c Bruce, b C. Lambton	2
c and b Lawson-Smith	14
c Landon, b Lawson-Smith	34
b C. Lambton	3
c and b C. Lambton	1
not out	24
run out	8
b C. Lambton	3
not out	0
Extras	12
Total (9 wickets)	122

YORKSHIRE GENTLEMEN.

1st Innings.

Capt. C. D. Bruce, b Butler	38
C. W. L. Fernandes, c Wynne, b Moorhouse	2
H. G. McL. Amos, b Perkins	60
Rev. E. B. Firth, b Moorhouse	59
Hon. D. Lambton, b Butler	14
Hon. C. Lambton, c Straubenzee, b Moorhouse	32
C. W. Landon, b Butler	5
C. P. Sykes, c Wynne, b Stanton	21
E. M. Lawson-Smith, not out	14
C. J. Fox, c Straubenzee, b Butler	1
T. G. Walker, b Butler	0
Extras	16
Total	262

2nd Innings.

c Moorhouse, b Butler	7
c Curteis, b Butler	26
c Perkins, b Moorhouse	20
c Stanton, b Butler	12
b Butler	22
b Butler	7
b Butler	24
c Moorhouse, b Perkins	37
c Curteis, b Butler	11
c Curteis, b Butler	12
not out	4
Extras	25
Total	207

ROYAL ARTILLERY v. HOUSEHOLD BRIGADE.
PLAYED AT BURTON'S COURT, CHELSEA, 28TH AND 29TH JUNE.

ROYAL ARTILLERY.

<i>1st Innings.</i>		<i>2nd Innings.</i>	
C. C. Van Straubenzee, b Powell	102	b Powell	39
W. L. Foster, b Gosling	1	lbw, b Amory	19
H. C. Moorhouse, b Dixon	0	c sub., b Amory	0
F. H. G. Stanton, b Dixon	6	b Gosling	39
Major LLOYD, b Dixon	2	b Amory	2
Capt. Adair, b Powell	57	b Amory	5
Capt. Phipps-Hornby, b Powell	2	not out	30
Major Davidson, b Gosling	11	c Cumner, b Gosling	0
E. W. Davies, c Cotton, b Gosling	6	run out	0
N. E. B. Bellairs, not out	0	c Cumner, b Amory	12
Gunner Butler, b Powell	0	c Cumner, b Powell	14
Extras	20	Extras	18
Total	207	Total	178

HOUSEHOLD BRIGADE.

<i>1st Innings.</i>		<i>2nd Innings.</i>	
B. V. Wentworth, b Butler	21	run out	55
Capt. Cotton, c Adair, b Bellairs	54	lbw, b Butler	3
W. S. Gosling, c Foster, b Bellairs	39	b Butler	0
Sergt. Cumner, c Hornby, b Bellairs	2	b Butler	0
H. H. Amory, b Bellairs	18	c and b Adair	11
J. H. R. Bailey, c Davies, b Butler	4	c Butler, b Adair	0
Drummer Hughes, b Butler	13	b Butler	2
F. H. Bathurst, b Butler	12	b Bellairs	21
G. Trotter, run out	0	b Butler	4
Pte. Powell, not out	18	b Butler	13
Pte. Dixon, lbw, b Butler	9	not out	6
Extras	8	Extras	12
Total	198	Total	127

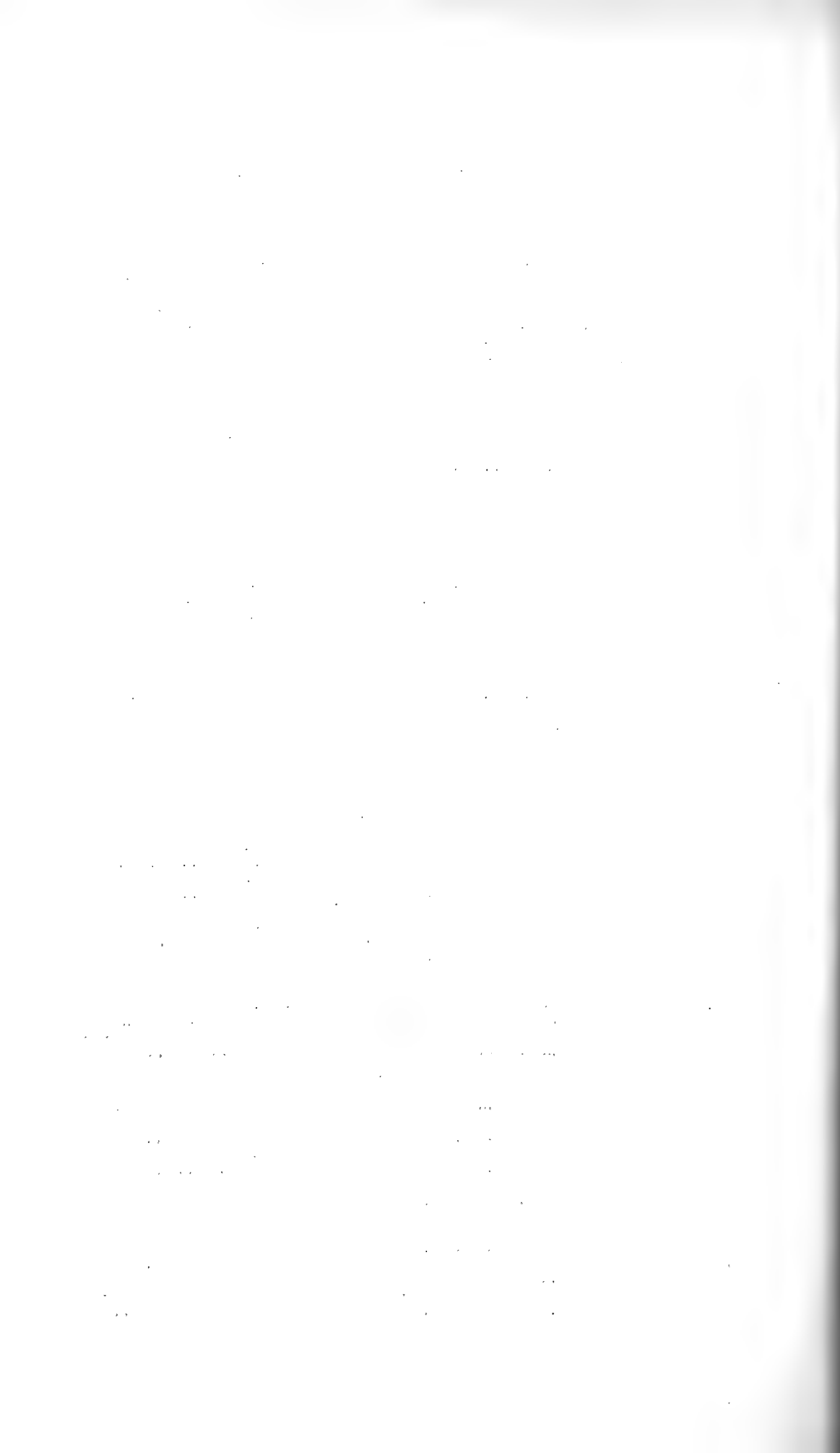
ROYAL ARTILLERY v. HARLEQUINS.
PLAYED AT WOOLWICH, 8TH AND 9TH JULY.

ROYAL ARTILLERY.

<i>1st Innings.</i>		<i>2nd Innings.</i>	
C. C. Van Straubenzee, c Collins, b Cunliffe	29	b Cunliffe	0
Capt. Wynne, b Collins	7	lbw, b Cunliffe	19
W. L. Foster, b Cunliffe	75	b Collins	16
Major Curteis	0	b Cunliffe	25
Capt. Adair, c Collins, b Robertson-Walker	29	b Cunliffe	11
R. A. Craig, b Robertson-Walker	15	b Collins	0
A. E. J. Perkins, b Cunliffe	12	c A. J. Webbe, b Cunliffe	8
W. O. Holloway, c Capt. Webbe, b Cunliffe	1	b Collins	17
F. H. G. Stanton, c Phipps-Hornby, b Cunliffe	11	c Bosworth-Smith, b Cunliffe	6
Capt. R. P. Benson, c A. J. Webbe, b Cunliffe	16	not out	17
Gunner Butler, not out	14	b Collins	5
Extras	19	Extras	17
Total	288	Total	141

HARLEQUINS.

<i>1st Innings.</i>		<i>2nd Innings.</i>	
H. T. Hewett, c Wynne, b Holloway	19	c Curteis, b Butler	16
A. J. Webbe, c Craig, b Benson	32	c Curteis, b Holloway	2
B. N. Bosworth-Smith, b Holloway	83	c Wynne, b Holloway	44
J. G. Walker, b Holloway	3	b Holloway	9
C. Seymour, c Benson, b Adair	18	b Holloway	22
Prince Christian Victor, c Craig, b Benson	3	c Straubenzee, b Wynne	3
J. Robertson-Walker, b Benson	0	not out	22
Capt. Webbe, c Craig, b Benson	0	c Adair, b Butler	1
F. H. E. Cunliffe, b Adair	16	b Butler	7
Capt. Phipps-Hornby, b Holloway	1	c Adair, b Holloway	1
W. E. W. Collins, not out	3	b Holloway	6
Extras	8	Extras	15
Total	186	Total	148



DIARY OF FIXTURES.



AUGUST.

Day of the							
Mth	Wk.	Regimental.		Cricket, &c.		Private.	
1	Th	...	...	...	...	...	...
2	F	...	...	R.A. v. B.B. at Woolwich.	...	...	...
3	S	...	...	R.A. v. B.B. at Woolwich.	...	...	...
4	S	...	...	...	...	...	...
5	M	Bank Holiday.		...	...	...	...
6	T	...	...	...	...	...	...
7	W	...	...	R.A. v. I.Z. at Woolwich.	...	...	...
8	Th	...	...	R.A. v. I.Z. at Woolwich.	...	...	...
9	F	...	...	...	...	...	...
10	S	...	...	R.A. Woolwich v. N.-C. Officers at Woolwich.	...	...	...
11	S	...	...	...	...	...	...
12	M	...	...	...	...	'Ubique' Lodge meets at "Criterion."	
13	T	...	...	...	...	...	...
14	W	...	...	...	...	...	...
15	Th	...	...	...	...	...	...
16	F	...	...	R.A. Woolwich v. West Kent at Chislehurst.	...	...	...
17	S	7th Div. F.A. & 'U' R.H.A. (Woolwich) joins at Shoeburyness.		...	...	...	...
18	S	...	...	...	...	...	...
19	M	...	...	...	...	...	...
20	T	5th Division F.A. (Exeter) joins at Okhampton.		...	...	...	...
21	W	...	...	R.A. Woolwich v. Charlton Park at Woolwich.	...	...	...
22	Th	...	...	...	...	...	...
23	F	...	...	...	...	...	...
24	S	2nd Field Gunnery Course at Okhampton begins. 8th Division F.A. (Woolwich) joins at Shoeburyness.		R.A. Woolwich v. Brentwood at Woolwich.	...	...	...
25	S	...	...	...	...	...	...
26	M	...	...	...	...	...	...
27	T	...	...	...	...	...	...
28	W	...	...	...	...	...	...
29	Th	...	...	...	...	...	...
30	F	...	...	...	...	...	...
31	S	...	...	...	...	...	...

SEPTEMBER.

Day of the				
Mth	Wk.	Regimental.	Cricket, &c,	Private.
1	S	...	...	...
2	M	...	...	...
3	T	...	...	...
4	W	...	...	...
5	Th	...	...	...
6	F	...	...	...
7	S	...	...	...
8	S	...	...	...
9	M	Special Class Hydraulics, Steam &c. begins.	...	'Ubique' Royal Arch Chapter meets at "Criterion."
10	T	...	Doncaster begins.	...
11	W	...	St Leger.	...
12	Th	...	...	...
13	F	...	...	...
14	S	...	...	...
15	S	...	...	...
16	M	...	...	...
17	T	...	...	...
18	W	...	...	...
19	Th	...	...	...
20	F	...	...	...
21	S	...	...	...
22	S	...	...	...
23	M	...	...	...
24	T	...	...	...
25	W	...	...	...
26	Th	...	...	...
27	F	...	...	...
28	S	...	...	...
29	S	...	...	...
30	M	...	...	...

OCTOBER.

1	T	...	...	...	...
2	W	...	...	...	...
3	Th	...	...	...	...
4	F	...	...	...	...
5	S	...	...	...	...
6	S	...	...	...	...
7	M	...	...	...	...
8	T	...	...	...	...
9	W	...	...	...	...
10	Th	...	...	...	...
11	F	...	...	...	...
12	S	...	...	...	...
13	S	...	...	...	...
14	M	...	...	...	...
15	T	...	...	...	...
16	W	...	...	...	...
17	Th	...	...	...	'Ubique' Mark Lodge of Mark Master Masons meets at "Criterion."
18	F	...	...	...	...
19	S	...	...	...	...
20	S	...	...	...	...
21	M	...	...	...	...
22	T	...	...	...	...
23	W	...	...	...	...
24	Th	...	...	...	...
25	F	...	...	...	...
26	S	...	...	...	...
27	S	...	...	...	...
28	M	...	...	...	...
29	T	...	...	...	...
30	W	...	...	...	...
31	Th	...	...	...	...

INTER-REGIMENTAL RACKET AND BILLIARD MATCHES.



R.A. v. R.E.

Played at Woolwich, March 29th and 30th, 1895.

DOUBLE RACKETS.

PLAYED AT 2.30 P.M., 29TH.

R.A.

CAPTAIN A. M'N. COOPER-KEY.
LIEUT. F. D. QUINTON.

R.E.

{ CAPTAIN J. E. HAMILTON.
{ LIEUT. E. M. BLAIR.

lost to

<i>1st Game.</i>	<i>2nd Game.</i>	<i>3rd Game.</i>	<i>4th Game.</i>	<i>5th Game.</i>	<i>6th Game.</i>	<i>7th Game.</i>
R.A. 15.	R.A. 8.	R.A. 6.	R.A. 15.	R.A. 15.	R.A. 4.	R.A. 7.
R.E. 6.	R.E. 15.	R.E. 15.	R.E. 6.	R.E. 4.	R.E. 15.	R.E. 15.

SINGLE RACKETS.

SECOND PAIR PLAYED AT 10.15 A.M. 30TH.

R.A.

LIEUT. A. E. J. PERKINS.

beat

R.E.

LIEUT. E. M. BLAIR.

<i>1st Game.</i>	<i>2nd Game.</i>	<i>3rd Game.</i>	<i>4th Game.</i>	<i>5th Game.</i>
R.A. 8.	R.A. 18.	R.A. 13.	R.A. 17.	R.A. 15.
R.E. 15.	R.E. 16. } set 5.	R.E. 15.	R.E. 14. } set 3.	R.E. 4.

FIRST PAIR PLAYED AT 11.30 A.M. 30TH.

CAPTAIN A. M'N. COOPER-KEY.

beat

CAPTAIN J. E. HAMILTON.

<i>1st Game.</i>	<i>2nd Game.</i>	<i>3rd Game.</i>	<i>4th Game.</i>	<i>5th Game.</i>
R.A. 15.	R.A. 8.	R.A. 15.	R.A. 11.	R.A. 18.
R.E. 7.	R.E. 15.	R.E. 6.	R.E. 15.	R.E. 13. } set 5.

The R.A. won the odd event after every game had been contested in all matches and keep the Cup through the ensuing year.

BILLIARDS.

THIRD PAIR PLAYED AT 5 P.M. 29TH IN R.A.I. LECTURE THEATRE.

R.A.

MAJOR F. A. CURTEIS.

beat

R.E.

2ND LIEUT. C. ST. B. SLADEN.

300.

297.

Best breaks 28, 27, 23, 25, 22, 20, 19, 15,
14, 14 unfinished.

Best breaks 33, 30, 21, 20, 20, 13, 12, 11,
11, 11, 10, 10.

FIRST PAIR PLAYED AT 9.45 P.M.

CAPTAIN E. M. LACHLAN

beat

LIEUT.-COL. A. R. E. DORWARD, D.S.O.

300.

210.

Best breaks 43 unfinished, 35, 21, 18, 16,
16, 13, 11, 10, 10, 10.

Best breaks 27, 19, 18, 15, 12.

THIRD PAIR PLAYED AT 11.45 P.M.

2ND LIEUT. S. SELIGMAN.

lost to

CAPTAIN H. N. DUMBLETON.

288.

300.

Best breaks 36, 21, 17, 14, 14, 13, 11, 10.

Best breaks 27, 20, 19, 19, 17, 17, 16, 15, 13,
13, 13, 12, 12 unfinished.

The R.A. won the odd event and keep the Cup through the ensuing year.

R.A. & R.E. Annual Racket and Billiard Matches.

The results of the Racket and Billiard Matches up to and including the present year are shewn below :—

1873.

<i>Rackets.</i>		<i>Billiards.</i>	
<i>Double.</i> R.A. 1.	R.E. 4.	<i>Double.</i> R.A. 500.	R.E. 497.
Lieut. W. E. Denison.	Lieut. L. K. Scott.	Lieut.-Col. Drayson.	Capt. Seton.
" W. L. Davidson.	" S. M. Maycock.	Major Maitland.	" Mant.
<i>Single.</i> R.A. 2.	R.E. 3.	<i>Single.</i> R.A. 500.	R.E. 361.
Lieut. W. L. Davidson.	Lieut. S. M. Maycock.	Major Maitland.	Capt. Mant.

1874.

<i>Rackets.</i>		<i>Billiards.</i>	
<i>Double.</i> R.A. 4.	R.E. 1.	<i>Double.</i> R.A. 500.	R.E. 492.
Major Newman.	Lieut. L. K. Scott.	Major Maitland.	Capt. Warburton.
Lieut. Crookenden.	" Tower.	Lieut. Anstruther.	" Seton.
<i>Single.</i> R.A. 0.	R.E. 3.	<i>Single.</i> R.A. 370.	R.E. 500.
Lieut. Crookenden.	Lieut. Tower.	Major Maitland.	Capt. Warburton.

1875.

<i>Rackets.</i>		<i>Billiards.</i>	
<i>Double.</i> R.A. 0.	R.E. 4.	<i>Double.</i> R.A. 500.	R.E. 494.
Capt. Anderson.	Lieut. Tower.	Capt. Hazlerigg.	Major Warburton.
Lieut. Crookenden.	" Hon. M. G. Talbot.	Lieut. Anstruther.	Capt. Skinner.
<i>Single.</i> R.A. 0.	R.E. 3.	<i>Single.</i> R.A. 286.	R.E. 500.
Capt. Anderson.	Lieut. Tower.	Lieut. Anstruther.	Major Warburton.

1876.

<i>Rackets.</i>		<i>Billiards.</i>	
<i>Double.</i> R.A. 3.	R.E. 4.	<i>Double.</i> R.A. 500.	R.E. 451.
Major Murdoch.	Lieut. Penrose.	Capt. Hutchinson.	Major Warburton.
Lieut. Anstruther.	" Onslow.	Lieut. Anstruther.	Capt. Skinner.
<i>Single.</i> R.A. 1.	R.E. 3.	<i>Single.</i> R.A. 479.	R.E. 500.
Major Murdoch.	Lieut. Penrose.	Lieut. Anstruther.	Major Warburton.

1879.

<i>Rackets.</i>		<i>Billiards.</i>	
<i>Double.</i> R.A. 4.	R.E. 0.	<i>Double.</i> R.A. 500.	R.E. 430.
Capt. Griffiths.	Capt. L. K. Scott.	Major Hutchinson.	Major Seton.
Lieut. D. C. Carter.	Lieut. W. A. Cairnes.	Capt. Anstruther.	Capt. Glancy.
<i>Single.</i> R.A. 3.	R.E. 1.	<i>Single.</i> R.A. 500.	R.E. 421.
Lieut. D. C. Carter.	Lieut. W. A. Cairnes.	Capt. Anstruther.	Capt. Glancy.

1880.

<i>Rackets.</i>		<i>Billiards.</i>	
<i>Double.</i> R.A. 4.	R.E. 0.	<i>Double.</i> R.A. 500.	R.E. 430.
Lieut. King.	Lieut. R. S. Hedley.	Major Hutchinson.	Major Manderson.
" Cooper-Key.	" W. A. Cairnes.	Capt. Anstruther.	Capt. Glancy.
<i>Single.</i> R.A. 0.	R.E. 3.	<i>Single.</i> R.A. 458.	R.E. 500.
Lieut. D. C. Carter.	Lieut. W. A. Cairnes.	Capt. Anstruther.	Major Manderson.

1881.

Rackets.

<i>Double.</i>	R.A.	4.	R.E.	0.
Lieut. King.			Lieut. S. M. Maycock.	
" Cooper-Key.			" W. A. Cairnes.	
<i>Single.</i>	R.A.	3.	R.E.	1.
Lieut. Cooper-Key.			Lieut. W. A. Cairnes.	

Billiards.

<i>Double.</i>	R.A.	500.	R.E.	362.
Major Hutchinson.			Capt. Glancy.	
Capt. Anstruther.			" Broadfoot.	
<i>Single.</i>	R.A.	500.	R.E.	468.
Capt. Anstruther.			Major Mant.	

1882.

Rackets.

<i>Double.</i>	R.A.	4.	R.E.	2.
Lieut. C. D. King.			Lieut. Tower.	
" Cooper-Key.			" Friend.	
<i>Single.</i>	R.A.	3.	R.E.	1.
Lieut. Cooper-Key.			Lieut. Tower.	

Billiards.

<i>Double.</i>	R.A.	300.	R.E.	252.
Col. Maitland.			Major Seton.	
Lieut. Bruen.			Major Glancy.	
<i>Single.</i>	R.A.	500.	R.E.	437.
Col. Maitland.			Major Seton.	

1883.

Rackets.

<i>Double.</i>	R.A.	1.	R.E.	4.
Lieut. C. D. King.			Lieut. Tower.	
" Cooper-Key.			" Friend.	
<i>Single.</i>	R.A.	1.	R.E.	3.
Lieut. C. D. King.			Lieut. Tower.	

Billiards.

<i>Double.</i>	R.A.	267.	R.E.	300.
Col. Maitland.			Lieut. Bor.	
Capt. Anstruther.			Lieut. Dumbleton.	
<i>Single.</i>	R.A.	500.	R.E.	297.
Capt. Anstruther.			Lieut. Dumbleton.	

1884.

Rackets.

<i>Double.</i>	R.A.	2.	R.E.	4.
Lieut. Cooper-key.			Lieut. Tower.	
" C. D. King.			" Friend.	
<i>Single.</i>	R.A.	2.	R.E.	3.
Lieut. Cooper-Key.			Lieut. Tower.	

Billiards.

<i>Double.</i>	R.A.	277.	R.E.	300.
Lieut.-Col. Hazlerigg.			Lieut. Dumbleton.	
Capt. Anstruther.			Capt. Digby.	
<i>Single.</i>	R.A.	500.	R.E.	398.
Capt. Anstruther.			Lieut. Dumbleton.	

1885.

Rackets.

<i>Double.</i>	R.A.	4.	R.E.	2.
Lieut. Cooper-Key.			Capt. Friend.	
" C. D. King.			Lieut. Hamilton.	
<i>Single.</i>	R.A.	3.	R.E.	1.
Lieut. Cooper-Key.			Capt. Friend.	

Billiards.

<i>Double.</i>	R.A.	300.	R.E.	274.
Major Anstruther.			Capt. Digby.	
Capt. MacMahon.			" Baddeley.	
<i>Single.</i>	R.A.	500.	R.E.	248.
Major Anstruther.			Capt. Digby.	

1890.

Rackets.

<i>Double.</i>	R.A.	1.	R.E.	4.
Captain Cooper-Key.			Lieut. Hedley.	
Lieut. Simonds.			" Sheppard.	
<i>Single.</i>	R.A.	0.	R.E.	3.
Captain Cooper-Key.			Lieut. Hedley.	

Billiards.

<i>Double.</i>	R.A.	235.	R.E.	300.
Major Anstruther.			Captain Digby.	
Lieut. Lachlan.			" Dumbleton.	
<i>Single.</i>	R.A.	500.	R.E.	489.
Major Anstruther.			Captain Dumbleton.	

1891.

Rackets.

<i>Double.</i>	R.A.	2.	R.E.	4.
Captain Cooper-Key.			Captain Hedley.	
2nd Lieut. Galloway.			2nd Lieut. Sheppard.	
<i>Single.</i>	R.A.	3.	R.E.	2.
Captain Cooper-Key.			Captain Hedley.	

Billiards.

<i>Double.</i>	R.A.	300.	R.E.	250.
Major Anstruther.			Colonel Glancy.	
Lieut. Pollock.			Capt. Hedley.	
<i>Single.</i>	R.A.	444.	R.E.	500.
Major Anstruther.			Colonel Glancy.	

1892.**Rackets.**

<i>Double.</i>	R.A. 4.	R.E. 0.
Captain Cooper-Key.	Captain Hamilton.	
Lieut. & Capt. Quinton.	Lieut. Blair.	
<i>Single.</i>	R.A. 3.	R.E. 0.
Captain Cooper-Key.	Captain Hamilton.	

Billiards.

<i>Double.</i>	R.A. 300.	R.E. 291.
Captain Curteis.	Colonel Glancy.	
Captain Pollock.	Captain Roberts.	
<i>Single.</i>	R.A. 500.	R.E. 469.
Captain Pollock.	Colonel Glancy.	

1893.**Rackets.**

<i>Double.</i>	R.A. 4.	R.E. 1.
Captain Cooper-Key.	Captain Hamilton.	
Lieut. & Capt. Quinton.	Lieut. Blair.	
<i>Single.</i>	R.A. 2.	R.E. 3.
Captain Cooper-Key.	Captain Hamilton.	

Billiards.

<i>Double.</i>	R.A. 231.	R.E. 300.
Major Curteis.	Major Dorward, D.S.O.	
Captain Pollock.	Lieut. Jones.	
<i>Single.</i>	R.A. 500.	R.E. 303.
Major Curteis.	Major Dorward, D.S.O.	

1894.**Rackets.**

<i>Double.</i>	R.A. 1.	R.E. 4.
Captain Cooper-Key.	Captain Hamilton.	
Captain C. D. King.	Lieut. Blair.	
<i>1 Single.</i>	R.A. 3.	R.E. 1.
Captain Cooper-Key.	Captain Hamilton.	
<i>2 Single.</i>	R.A. 0.	R.E. 3.
Lieut. Quinton.	Lieut. Blair.	

Billiards.

<i>1 Single.</i>	R.A. 255.	R.E. 300.
Captain Vans-Agnew.	Major Dorward, D.S.O.	
<i>2 Single.</i>	R.A. 285.	R.E. 300.
Major Curteis.	Lieut. Jones.	
<i>3 Single.</i>	R.A. 300.	R.E. 134.
Captain Lachlan.	Major Ruck.	

1895.**Rackets.**

<i>Double.</i>	R.A. 3.	R.E. 4.
Captain Cooper-Key.	Captain Hamilton.	
Lieutenant Quinton.	Lieutenant Blair.	
<i>1 Single.</i>	R.A. 3.	R.E. 2.
Captain Cooper-Key.	Captain Hamilton.	
<i>2 Single.</i>	R.A. 3.	R.E. 2.
Lieutenant Perkins.	Lieutenant Blair.	

Billiards.

<i>1 Single.</i>	R.A. 300.	R.E. 210.
Captain Lachlan.	Lieut.-Col. Dorward.	
<i>2 Single.</i>	R.A. 288.	R.E. 300.
Lieutenant Seligman.	Captain Dumbleton.	
<i>3 Single.</i>	R.A. 300.	R.E. 297.
Major Curteis.	Lieutenant Sladen.	

DIARY OF FIXTURES.

MAY.

Day of the

Mth	Wk.	Regimental.	Cricket, &c.	Private.
1	W	1st Division (Siege) course at Lydd begins.	R.A. Woolwich v. R.N. College, at Woolwich.	... ..
2	Th	...	...	...
3	F	...	...	...
4	S	1st Division course begins at Portsmouth and Sandown. 1st Division R.H.A. (Aldershot) joins at Shoeburyness.	R.A. Woolwich v. Shoeburyness at Shoebury.	.. ...
5	S	...	...	...
6	M	Position-finding class begins.	...	...
7	T	...	...	...
8	W	...	...	...
9	Th	...	...	...
10	F	...	...	...
11	S	1st Division F.A. (Aldershot) joins at Okehampton. 2nd Division F.A. (Aldershot) joins at Shoeburyness.	R.A. Woolwich v. N.C. Officers at Woolwich.	... ..
12	S	...	...	...
13	M	...	...	'Ubique' Lodge meets at "Criterion." Installation of W.M.
14	T	...	...	...
15	W	...	...	...
16	Th	...	...	...
17	F	...	...	...
18	S	3rd Division R.H.A. (Woolwich) joins at Shoeburyness	R.A. Woolwich v. Blackheath at Blackheath.	... ..
19	S	...	...	...
20	M	...	R.A. v. Greenjackets, at Woolwich.	... ..
21	T	...	R.A. v. Greenjackets, at Woolwich.	... ..
22	W	...	...	...
23	Th	...	...	...
24	F	...	R.A. v. Aldershot Division at Aldershot.	... ..
25	S	1st Division R.H.A. begins at Glenbeigh. 2nd Division course begins at Portsmouth and Sandown. 4th Division F.A. (Woolwich) joins at Shoeburyness.	R.A. v. Aldershot Division at Aldershot.	... ..
26	S	...	...	...
27	M	...	...	...
28	T	...	Epsom Meeting begins.	...
29	W	...	Derby.	...
30	Th	...	...	...
31	F	"Chestnut Troop" Dinner.	Oaks.	... ..

JUNE.

Day of the

Mth	Wk.	Regimental.	Cricket, &c.	Private.
1	S	5th Division F.A. (Ipswich) joins at Shoeburyness.	... ..	... ..
2	S	Whit Sunday.	... ..	... ..
3	M	Bank Holiday.	R.A. Woolwich v. R.M.A., at R.M.A.	... ..
4	T	...	... ..	... ..
5	W	2nd Division F.A. (Hilsea) joins at Okehampton.	... ..	... ..
6	Th	...	... ..	... ..
7	F	Annual General Meeting of R.A.I. at R.U.S.I. at 3 p.m. 2nd Division F.A. at Glenbeigh begins.	REGIMENTAL DINNER.	
8	S	6th Division F.A. (Weedon) joins at Shoeburyness.	... ..	... ..
9	S	...	... ..	... ..
10	M	...	... ..	'Ubique' Royal Arch Chapter meets at "Criterion." Installation of Principals.
11	T	...	... ..	... ..
12	W	...	... ..	... ..
13	Th	...	R.A. v. Quidnuncs at Woolwich.	... ..
14	F	Ball at R.A. Mess, Woolwich.	R.A. v. Quidnuncs at Woolwich.	... ..
15	S	3rd Division course begins at Portsmouth and Sandown.	R.A. Woolwich v. Shoeburyness, at Woolwich.	... ..
16	S	...	...	... ..
17	M	...	R.A. v. Eton Ramblers, at Woolwich.	... ..
18	T	...	R.A. v. Eton Ramblers, at Woolwich. Ascot begins.	... ..
19	W	...	... ..	... ..
20	Th	...	... ..	... ..
21	F	3rd Division F.A. at Glenbeigh begins.	R.A. v. R.E., at Woolwich.	... ..
22	S	...	R.A. v. R.E., at Woolwich.	... ..
23	S	...	...	... ..
24	M	...	Old Shoebury match.	... ..
25	T	...	Old Shoebury match.	... ..
26	W	...	R.A. v. Yorkshire Gentlemen, at Woolwich.	... ..
27	Th	...	R.A. v. Yorkshire Gentlemen, at Woolwich.	... ..
28	F	2nd Division (Siege) course at Lydd begins.	R.A. v. Household Brigade, at Burton's Court, Chelsea.	... ..
29	S	...	R.A. v. Household Brigade, at Chelsea.	... ..
30	S	...	... ..	... ..

JULY.

1	M	3rd Division F.A. (Shorncliffe) joins at Okehampton.	... ..	... ..
2	T	...	... ..	... ..
3	W	...	... ..	... ..
4	Th	...	Oxford v. Cambridge begins.	... ..
5	F	4th Division (Field) course at Glenbeigh begins.	... ..	... ..
6	S	Position-finding class ends. 1st Field Gunnery Course at Okehampton begins	R.A. Woolwich v. Brentwood, at Brentwood.	... ..
7	S	...	... ..	... ..
8	M	...	R.A. v. Harlequins, at Woolwich.	... ..
9	T	...	R.A. v. Harlequins, at Woolwich.	... ..
10	W	...	... ..	... ..
11	Th	...	... ..	... ..
12	F	...	Eton v. Harrow begins.	... ..

JULY.—Continued.

Day of the				
Mth	Wk.	Regimental.	Cricket, &c,	Private.
13	S	4th Division course Golden Hill and Sandown begins.	R.A. Woolwich v. Blackheath, at Woolwich.	... ..
14	S	...	...	...
15	M	...	...	...
16	T	...	...	...
17	W	...	...	...
18	Th	...	R.A. Woolwich v. West Kent at Woolwich.	'Ubique' Mark Lodge of Mark Master Masons meets at "Criterion." Installation of W.M.
19	F	...	R.A. v. R.E., at Chatham.	...
20	S	...	R.A. v. R.E., at Chatham.	...
21	S	...	...	...
22	M	...	R.A. v. Gentlemen of M.C.C. at Lord's.	...
23	T	...	R.A. v. Gentlemen of M.C.C. at Lord's.	...
24	W	...	...	...
25	Th	...	...	...
26	F	4th Division F.A. (Colchester) joins at Okchampton.	R.A. v. Free Foresters, at Woolwich.	...
27	S	...	R.A. v. Free Foresters, at Woolwich.	...
28	S	...	...	...
29	M	...	...	...
30	T	...	Goodwood begins.	...
31	W	...	...	...

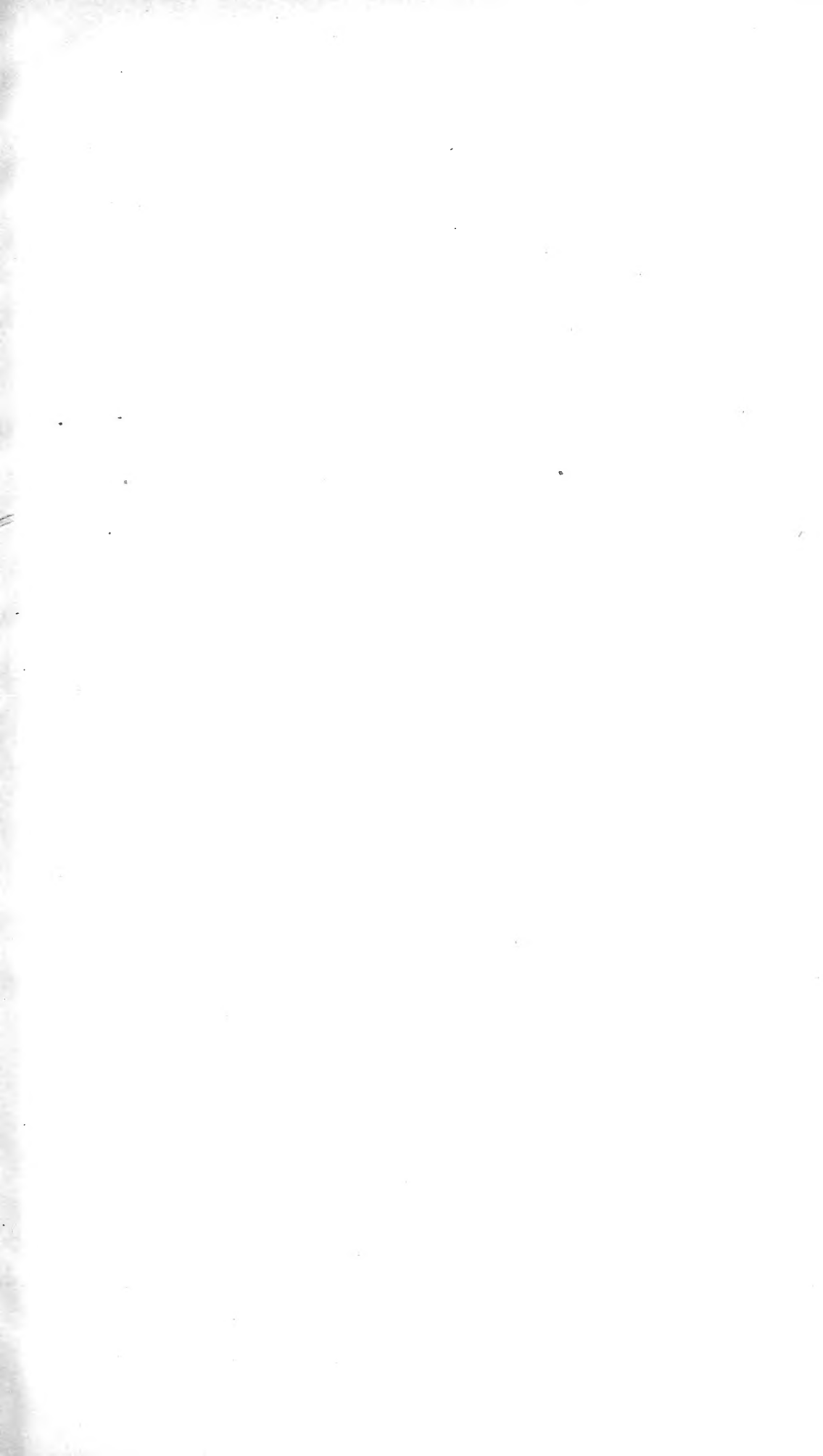
AUGUST.

1	Th	...	...	...	...
2	F	...	...	R.A. v. B.B. at Woolwich.	...
3	S	...	...	R.A. v. B.B. at Woolwich.	...
4	S	...	...	...	...
5	M	Bank Holiday.	...	...	...
6	T	...	...	...	...
7	W	...	...	R.A. v. I.Z. at Woolwich.	...
8	Th	...	...	R.A. v. I.Z. at Woolwich.	...
9	F	...	...	...	...
10	S	...	...	R.A. Woolwich v. N.-C. Officers at Woolwich.	...
11	S	...	...	...	...
12	M	...	...	...	'Ubique' Lodge meets at "Criterion."
13	T	...	...	...	...
14	W	...	...	...	...
15	Th	...	...	...	...
16	F	...	...	R.A. Woolwich v. West Kent at Chislehurst.	...
17	S	...	...	...	...
18	S	...	...	...	...
19	M	...	...	...	...
20	T	5th Division F.A. (Exeter) joins at Okchampton.	...	...	...
21	W	...	...	R.A. Woolwich v. Charlton Park at Woolwich.	...
22	Th	...	...	...	...
23	F	...	...	...	...
24	S	2nd Field Gunnery Course at Okchampton begins.	R.A. Woolwich v. Brentwood at Woolwich.
25	S
26	M
27	T
28	W
29	Th
30	F
31	S









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